



2019 Water & Sanitary Sewer Utility Planning Report

Ceresco, NE

February 2019

Village of Ceresco, Nebraska 2019 Water & Sanitary Sewer Utility Planning Report

Prepared by:

JEO Consulting Group, Inc.
2700 Fletcher Avenue
Lincoln, Nebraska 68504-1113
402.435.3080; Fax 402.435.4110

JEO Project Number: 181283.00

WATER & WASTEWATER STUDY FOR THE PUBLIC WATER SYSTEM VILLAGE OF CERESCO, NEBRASKA

1 General

1.1 Introduction

The following report provides an evaluation of the Ceresco public water and sewer system regarding its existing condition and viability for the future. This report includes an inventory of existing water and sewer system components and reviews the ability of each major component to serve possible developments around the Village. Finally, this report provides recommendations for improvements, opinions of probable construction costs and opinions of the Village's capacity for development.

1.2 Base Population Growth

Table 1-1: Historical Population Data was sourced from the most recent US Census. For the purpose of this study a population of 889 people was used for estimating current usage. Growth over the next 20 years was accounted for based on the development additions built within that time. As such, the growth was calculated individually per development within this study.

Table 1-1: Historical Population Data

Year	Population
1960	429
1970	474
1980	836
1990	825
2000	920
2010	889

1.3 Physical Location & Topography

The Village is located on the southern edge of Saunders County along Highway US-77 approximately 11 miles north of Lincoln, NE. **Appendix A: Aerial Photograph** depicts the Village and the surrounding area.

The terrain in the area is generally rolling hills with LiDAR collected elevations ranging from approximately 1180 feet at the south end of the Village near the wastewater treatment plant to about 1260 feet in the northwest corner. As can be seen in **Appendix B: Ceresco LiDAR Contour Map** the surface drainage generally flows to the south and there are a few small drainage creeks that run through the Village.

1.4 Environmental Considerations

1.4.1 Floodplain

If any structures are developed in an existing floodplain or floodway, they shall meet the “Minimum Standards for Floodplain Management Programs” as prescribed by the Nebraska Department of Natural Resources (DNR). Any structures constructed within the existing floodway need to have no impact on the existing water surface elevation for minimal permitting effort. Impacts to the floodplain may require cumbersome permitting efforts. A floodplain map of the area can be found in **Appendix C: DNR Floodplain Section Map**.

There are multiple proposed development areas that lie partially within the floodplain area. While it does not have a considerable effect on the water and wastewater service connections – further studies, beyond the scope of this study, will be required if developments plan to build in the area to satisfy permitting requirements.

1.4.2 Wetlands

Appendix D: Ceresco Wetlands Map contains a Wetlands map of the area obtained from the US Fish and Wildlife Service wetland data. While there are no immediately apparent conflicts with the wetland areas surrounding the Village, it is recommended that further analysis be performed to comply with permitting prior to development. Such analysis is outside the scope of this study.

1.5 Water Quality

At this time, the groundwater from the Village wells is of generally acceptable quality for domestic use as it has not contained contaminate levels of any element over the Maximum Contaminate Level (MCL) established by the EPA for drinking water. The drinking water is currently continuously treated with chlorine at point of entry as a disinfection measure.

2 Existing Conditions

2.1 Water Supply

The Village is currently supplied by a well field located northeast of town on County Road C approximately one-half mile east of US-77. There are 3 wells in operation, Well 4, Well 5, and Well 6. Well 6, being the larger well with a variable frequency drive (VFD), runs all the time with wells 4 and 5 alternating as necessary. **Table 2-1: Existing Well Production** shows the reported flow from each well from 2015 through 2018.

Table 2-1: Existing Well Production

	Well Production (Gallons)				Capacity (GPM)
	2015	2016	2017	2018 ¹	
Well 4	4,693,000	5,045,000	5,638,000	5,800,000	181
Well 5	5,485,000	5,409,000	6,859,000	5,600,000	168 ²
Well 6	17,323,000	16,767,000	19,135,000	17,650,000	396
TOTAL	27,501,000	27,221,000	31,632,000	29,050,000	745
Yearly Average Gallons per Capita per Day³	85	88	97	90	

¹ 2018 Data only available through November 2018. Final number includes an estimate for the month of December.

² 2003 Data Used – Suez unable to perform 2018 pump test on well 5

³ Using 2010 population of 889

Well capacities were obtained from testing completed in 2018 by Suez and in 2003 by Sargent Drilling (**Appendix E: Pump Tests**) and production numbers were obtained from Village records (**Appendix F: Well and WWTF Annual Flow Data**). Data from 2017 was used to assess current usage below.

Currently, the amount of water pumped by the Village (97 gpcpd) is an expected 'average' value of a community of its size. A value of 80 to 120 gpcpd is typically used as a design. Current design standards calculate the peak daily usage as 2.5 times the annual daily average and the peak hour flow as 4.0 times the daily average. See below for calculations

<u>Estimated Daily Average, Annual</u>	= 97 gpcpd x 889 people = 86,200 gpd = 60 gpm
<u>Estimated Peak Day Flow</u>	= 86,200 x 2.5 = 215,500 gpd = 150 gpm
<u>Estimated Peak Hour Flow</u>	= 60 gpm x 4.0 = 240 gpm

The Village currently has a combined peak hourly capacity of 745 gpm with all 3 wells in operation. If the largest of the three were to be out of service, the capacity would be reduced to 349 gpm. This capacity meets the current peak water needs.

2.2 Water Storage

The Village currently stores their water in a 300,000 gallon elevated storage tank on the east side of town on the north side of Main Street (County Road A). The tank was installed in 1980 and was last inspected in 2012. Overall condition was determined to be good. Considering average water use of 87,000 gpd the existing tank will provide about 3.5 days of water storage. The desired storage for a

system is usually 24 to 48 hours. The current tank has enough storage for the current demand and can support a notable amount of additional demand in the future. The Village wells and storage tank are currently operated by Utility Services Group. Fire flow demand was not assessed in this study.

2.3 Water Distribution

See **Appendix G: Water System Layout**. The water distribution system currently serves 340 residential and 24 low-use commercial users as shown in the appendix. It is comprised of approximately 41,000 linear feet of water line (excluding transmission from wells to tower) ranging from 2" to 10" in diameter and made of either PVC or older cast iron. The older cast iron lines are being replaced as necessary with newer PVC lines. A static hydrant test was conducted on Main Street about 500 feet west of 5th Avenue. Results were a static pressure of 55 psi which exceeds a minimum pressure of 20 psi. Further analysis should be done to determine the effect to existing users' pressure within the system prior to any large developments connecting to the system. The recommended analysis would consist of hydraulic modeling and is beyond the scope of this study.

2.4 Sanitary Sewer System

As shown in **Appendix H: Historical Village Maps** sheet 4 of 6, The sanitary sewer collection system consists of approximately 20,000 feet of 8", 7,300 feet of 6" and 700 feet of 4" sanitary mains. According to conversations with village staff, the Village currently jets one-quarter of the sewer system every three months. The system consists of PVC and VCP mains which are considered to be in good condition by the Village. The VCP mains are approximately 80 years old and are susceptible to cracks, breaks, and root intrusion due to their age. The Village operates three lift stations located on the east side of the Village. The municipal lift station located on Elm Street (approximately 200 feet west of Highway 77) is of interest for this report as it may serve some of the proposed development areas. It is designed to handle up to 150 gpm.

Wastewater is currently treated via a wastewater treatment facility (WWTF) south of the Village. The treatment facility is a mechanical style plant with an overflow lagoon system. The system was designed with extra capacity to account for the expected growth of the Village. Design loadings include capacity for a population of 1,150 people with an expected average inflow of 115,000 gpd, and a maximum daily flow of 287,000 gpd. Current flow and design capacities for the wastewater treatment facility has been provided by the city and can be found in **Appendix F: Well and WWTF Annual Flow Data and Design Flows**.

Table 2-2: WWTF Inflow

Year	Total Inflow (Gallons)	Average Gallons per Day	Gallons per Capita per Day
2015	18,035,000	49,400	56
2016	20,561,000	56,300	63
2017	17,783,000	48,700	55
*2018	16,450,000	45,100	51

*2018 Data only available through November 2018. Final number includes an estimate for the month of December.

Table 2-2: WWTF Inflow contains data about the inflow received at the WWTF. Monthly inflow data received from the Village noted that the highest monthly inflow from 2015-2018 was May of 2016 with

a flow of 2,368,000 gallons or about an average of 76,400 gpd, which is within the design capacity of the plant.

<u>Estimated Daily Average, Annual</u>	= 48,700 gpd = 34 gpm
<u>Estimated Peak Day Flow</u>	= 48,700 x 2.5 = 121,800 gpd
<u>Estimated Peak Hour Flow</u>	= 34 gpm x 4.0 = 136 gpm

3 Projected Development Impact

The following analysis was completed using limited available data about the intended use of the proposed developments at the time of this study. What is represented below is a conservative estimate of how the areas will be developed and their intended use. A map showing property boundaries and sanitary manhole elevations can be found in **Appendix I: Property Elevations and Boundaries**. At the time of this study areas A, B, and C were owned by James F. Hunter; Areas D and E by Mark A. Masek; Area F by Joyce M. Heyen; Areas G and H by Kevin L. Stark; Area I by Dennis W. Johnson; and Area J by Vera G. Hansen.

3.1 Methods and Considerations

Usage of the developments was unknown at the time of this study. The village has recently developed new zoning regulations which are expected to be approved in early 2019. A copy of the proposed zoning map is located in **Appendix J: Ceresco Zoning Map**. It was assumed that use will consist of residential and light commercial which are considered similar in water and wastewater load estimations. Assumptions were based on typical density and usage in the area. Design standards of 3.5 residences per acre and 3 people per residence were used to estimate population growth of the development areas.

Without further information or preliminary plats detailing the use of the development areas it was difficult to determine the layout and geometry of the required water main and wastewater lines. Prior to any construction, a more detailed sizing review is recommended as part of a future design project based on more detailed information for the proposed development to adequately size water and wastewater mains. Expected growth of water and sewer flows from developments was estimated using a value of 1,000 gallons/(acre*day). This value was used for estimating both water and wastewater flows of the developments. Any infrastructure located within the development itself was considered the responsibility of the developer for the sake of this study. Sample calculations and data are located in **Appendix K: Flow Calculations**.

Based on conversations with the Village and the static hydrant test, the Village does not experience any water pressure issues. Actual impacts to water pressures are complex and require a hydraulic model to be devised. Predictions are based on elevations for the areas themselves, but these are rudimentary and make no indication to the effect on the pressure received by other users. Further analysis prior to construction of large developments is recommended to assess the impact to the current and future users.

3.2 Proposed Developments

3.2.1 Area A

A preliminary plat has already been developed for this area and is included in **Appendix L: Hunter Addition Plat**. Estimations for this area were based on 66 parcels shown on the preliminary plat. This area is approximately 26 acres and was assumed to be fully developed and occupied. There is

a drainage creek that runs through the middle of the area which limits the number of parcels that can be built and impacts the geometry of the water and wastewater mains.

At a total calculated peak daily flow of 184 gpm, the Village water supply would have capacity to serve the area even with the largest well out of service. A daily average demand of 106,000 gpd was calculated, which places the storage tank at about 2.8 days capacity.

At 1,087 people and a calculated wastewater flow of 67,700 gpd average & 169,300 maximum, the WWTF is within the designed average (115,000 gpd) and maximum (287,000 gpd) inflow capacities, while nearing the design population (1,150). The area can connect to the manhole on Main Street located between manholes #15 and #16C (see **Appendix H: Historical Village Maps** sheet 4 of 5) on the south side of the area and manhole #15 itself to avoid crossing the creek. Topography appears to allow a gravity sanitary system.

3.2.2 Area B

Area B is an 80-acre area on the northwest corner of the Village. The area is hilly with elevations ranging from 1240 feet to 1280 feet.

At a total calculated peak daily flow of 290 gpm, the Village water supply would have capacity to serve the area if the largest well was out of service. A daily average demand of 167,000 gpd was calculated which places the storage tank at about 1.8 days capacity which is within the acceptable range. The area contains high elevations and is farthest from the water tower. A booster station may be required to serve adequate pressures to the area. Additional study is recommended prior to any development. The area can be served by the existing 10" water main on Main Street.

At 1,729 people and a calculated wastewater flow of 128,700 gpd average, and 322,000 gpd maximum, it is recommended the WWTF undergo a study to assess needed replacement or significant improvements. It is recommended the Village extend a new 8" sanitary main from Manhole #15 to the area on Main Street. The area would likely require a sanitary lift station, but that would fall within the confines of the area itself and is assumed the responsibility of the developer per recommendation from the Village for the sake of this study.

3.2.3 Area C

Area C is a 73-acre area south of the Village along Highway 77. The area is sloped upwards to the east and has a creek running from the north side of the property to the west. The area is adjacent to the WWTF.

At a total calculated peak daily flow of 202 gpm, the Village water supply would still have capacity to serve the area if the largest well was out of service. A daily average demand of 160,000 gpd was calculated which places the storage tank at about 1.9 days capacity which is within the acceptable range. The area would require a minimum of 8" water main be ran along 2nd Street to Pine Street to provide water to the area. A hydraulic model is recommended prior to construction to determine effect to Village water pressures.

At 1,656 people and a calculated wastewater flow of 121,700 gpd average, and 304,500 gpd maximum, it is recommended the WWTF undergo a study to assess needed replacement or significant improvements. No new sanitary main would be required if the area connects to the 8"

sanitary main on 2nd street near the WWTF. A lift station would likely be required within the area due to elevations and the creek running through the area, but that would fall within the confines of the area itself and is assumed the responsibility of the developer per recommendation from the Village for the sake of this study.

3.2.4 Area D

Area D is a 36-acre area east of the Village on the east side of Highway 77. At a total calculated peak daily flow of 176 gpm, the Village water supply would have capacity to serve the area with the largest well out of service. A daily average demand of 123,000 gpd was calculated which places the storage tank at about 2.4 days capacity. The area is recommended to connect to the 6" water main to the north on Elm Street just east of Highway 77.

At 1,267 people and a calculated wastewater flow of 84,700 gpd average and 212,000 maximum, the WWTF is within the designed average (115,000 gpd) and max (287,000 gpd) inflow capacities but exceeds design population (1,150). This may be an issue depending on the current loading. The current WWTF treatment loading data was not available at the time of this study, so further analysis may be required.

According to village staff, the bank and gas station are served by the lift station on Elm Street (approximately 200 feet west of Highway 77) for their wastewater needs. Lift station design information is available, but the current load on the lift station was unknown at the time. Thus, it is unknown whether the area can be served by that sanitary line or require improvements. The opinion of cost assumed adding 100 gpm capacity to the lift station. Prior to construction of this development, the lift station loading should be determined and required improvements identified.

3.2.5 Area E

Area E is a 68-acre area on south of the Village. The area was of high interest to be developed at the time of this study. It was discussed with Village officials that the owner of the property was considering developing only 10 residences and possibly some light commercial sites with the possibility of eventually having 300 residences on the area. No concrete information is known at the time of this study; thus, it was assumed that the whole area will be developed.

At a total calculated peak daily flow of 198 gpm, the Village water supply would have capacity to serve the area with the largest well out of service. A daily average demand of 155,000 gpd places the storage tank at about 1.9 days capacity which is within the acceptable range. The area would require a 10" Main to connect at Main Street. A hydraulic model is recommended prior to construction to determine effect to Village water pressures.

At 1,603 people and a calculated wastewater flow of 116,700 gpd average and 292,000 gpd maximum, it is recommended the WWTF undergo a study to assess needed replacement or significant improvements. Due to the elevations between Area E and the WWTF, a gravity sewer system was deemed infeasible to convey sanitary flows. Thus, a lift station and force main with capacities of 120 gpm were assumed for this study.

3.2.6 Area F

Area F is a small 6-acre area on the north end of the Village. Services do not appear limited by any topographical factors. The area is located adjacent to existing water and wastewater services. There is a 10" water main that runs along the north and west sides of the area.

At a total calculated peak daily flow of 155 gpm, the Village water supply has sufficient capacity to serve the area with the largest well out of service. A daily average demand of 93,000 gpd places the storage tank at about 3.2 days capacity.

At 952 people and a calculated wastewater flow of 54,700 gpd average and 137,000 gpd maximum, the WWTF is within the designed average (115,000 gpd) and max (287,000 gpd) inflow capacities, and the design population (1,150). The area can connect to manhole #32 just south of the area. Topography does not appear to be an issue for a gravity sewer system.

3.2.7 Area G

Area G is a 67-acre area south of the Village around the WWTF. It has creeks running from the north alongside the WWTF then to the south end of the area and it generally slopes down towards the east.

At a total calculated peak daily flow of 198 gpm, the Village water supply would have capacity to serve the area if the largest well was out of service. A daily average demand of 154,000 gpd places the storage tank at about 1.9 days capacity which is within the acceptable range. The area was assumed to connect to the 8" water main located at 3rd and Cedar Street adjacent to the development. No water distribution system improvements are recommended from the Village. A hydraulic model is recommended prior to construction to determine effect to Village water pressures.

At 1,593 people and a calculated wastewater flow of 115,700 gpd average and 289,500 gpd maximum, it is recommended the WWTF undergo a study to assess needed improvements. The population is above what the WWTF was designed for (1,150). A lift station within the development is likely required by the developer within the area due to elevations and the creek running through the area. The area is adjacent to the WWTF; thus, no wastewater collection system infrastructure is needed from the Village.

3.2.8 Area H

Area H is an 18-acre area near the southwest corner of the Village. It has a drainage creek running south from the northeast corner. At a total calculated peak daily flow of 164 gpm, the Village water supply would have the capacity to serve the area with the largest well out of service. A daily average demand of 105,000 gpd places the storage tank at about 2.9 days capacity. The area can connect to the 6" water main on Pine Street.

At 1,078 people and a calculated wastewater flow of 66,700 gpd average and 167,000 maximum, the WWTF is within the designed average (115,000 gpd) max (287,000 gpd) inflow capacities and design population (1,150). Connection to Manhole #3C would be most convenient.

The area would likely require a lift station to supply sanitary sewer services due to the creek and the low elevations to the east side of the area, but that would be the responsibility of the developer unless an agreement is made with the Village.

3.2.9 Area I

Area I is a small group of properties totaling 15-acres and are owned by a single person. It is located on the south end of town. The proximity and sizes of the individual properties are the reason for their being analyzed as a single area. It surrounds existing homes and has drainage creeks running through parts of the area.

At a total calculated peak daily flow of 161 gpm, the Village water supply would still have capacity to serve the area with the largest well out of service. A daily average demand of 102,000 gpd places the storage tank at about 2.9 days capacity. The area can be served by the existing 8" water main on Ash Street and/or the 6" on Pine Street depending on the developer's preference.

At 1,047 people and a calculated wastewater flow of 63,700 gpd average and 159,500 gpd maximum, the WWTF is well within the designed average (115,000), max (287,000) inflow gpd numbers, and the design population (1,150). The area can connect to manhole #20 at the northeast corner of the area. Due to the low elevations of the properties relative to the surrounding sanitary manholes, the developer will likely need to install a lift station. A gravity system would not be able to properly convey the wastewater to the WWTF. The lift station would be the responsibility of the developer unless an agreement is made with the Village.

3.2.10 Area J

Area J is a small area on the southwest corner of the Village. It is approximately 4 acres and ideal for full residential development. Services do not appear limited by any topographical factors. The area benefits from its location being adjacent to existing water and wastewater services on Pine Street.

At a total calculated peak daily flow of 154 gpm, the Village water supply would still have capacity to serve the area even with the largest well out of service. A daily average demand of 91,000 gpd places the storage tank at about 3.3 days capacity. Elevations do not appear to cause any issues with pressures.

At 931 people and a calculated wastewater flow of 52,700 gpd average and 132,000 gpd maximum, the WWTF is well within the designed average (115,000), max (287,000) inflow capacities, and the design population (1,150). The area can connect to manhole #5C at the northeast corner of the area. Topography does not appear to be an issue for a gravity system to convey flows to the WWTF.

The area can be served by the existing water main on Pine Street but would require the Village to upgrade the sanitary main on Pine Street to an 8" line to comply with regulations.

3.3 Final Conclusions

According to the data available, assumptions, and calculations made at the time of this report; the following conclusions were made for each area. Opinions of probable cost are also based on limited data.

Area A is a medium sized area and no improvements are recommended to the water and sanitary systems. The requirements for the area are close to the infrastructure limits, so while the Village may prefer to make slight improvements to have redundancy, nothing is recommended at this time.

Area B is a large area that would require additional capacity added to the Village water and sanitary infrastructure. Improvements are recommended to the sanitary collection system, water distribution system, a booster station, a hydraulic analysis is recommended to determine the effects on users' water pressure, and a WWTF assessment is needed. Opinion of probable cost is \$940,000 as shown in **Appendix M**.

Area C is a large area that would require improvements to the Village water and sanitary infrastructure. Significant improvements to the water distribution system and a hydraulic analysis would have to be performed to determine the effects on users' water pressure. Opinion of probable cost is \$110,000 as shown in **Appendix M**.

Area D is a large area that would require improvements to the Village water and sanitary infrastructure. Recommended improvements include extending the water distribution system, lift station improvements, and extending the sanitary collection system. Studies for the WWTF and lift station improvements are recommended. Opinion of probable cost is \$390,000 as shown in **Appendix M**.

Area E is a large area that would require improvements to the Village water and sanitary infrastructure. It would require improvements to the distribution system and a lift station & force main. Studies for the WWTF and lift station improvements are recommended. Opinion of probable cost is \$720,000 as shown in **Appendix M**.

Area F would have minimal impact to the existing system and its location is convenient for connecting into the water distribution and sanitary collection system. No improvements are necessary to serve this area based on available information.

Area G is a large area that would have minimal impact to the existing system and its location is convenient for connecting into the water distribution and sanitary collection system. It is recommended that a hydraulic model analysis be conducted along with a study analyzing the impacts to the WWTF should this entire development be constructed.

Area H would have minimal impact to the existing system and its location is convenient for connecting into the water distribution and sanitary collection system. No improvements are necessary to serve this area based on available information.

Area I has minimal impact to the existing system and its location is convenient for connecting into the water distribution and sanitary collection system. No Village improvements are necessary to serve this area based on available information.

Area J has minimal impact on the existing system and requires minor improvements to the sanitary collection system. It has nearby access to existing services and is not limited by topographical factors. Opinion of probable cost is \$110,000 as shown in **Appendix M**.

Per the recommendation of the Village of Ceresco, analysis of needed improvements was conducted on an individual development basis. Should multiple developments be constructed at a time, the cumulative impacts of the additional users should be assessed for the Village's water and sanitary infrastructure. Also, the analysis of impacts to the existing sewer capacity concerns at 2nd & Pine Streets documented in the August 2000 City Council minutes would apply to Areas A, B, D, F, J, H, and I. Should over 39 cumulative residences be proposed within these areas, an updated hydraulic modeling and study of this capacity concern is recommended.

Table 4-1: Summary of opinion of probable cost and impacts to users

Area	Recommended Improvements	Estimated Capital Costs	Estimated Daily Sanitary Sewer (gpd)	Estimated Monthly (30-day) Sanitary Sewer (1000 gpd)
A	None	\$0	\$0	\$0
B	Booster Sanitary Main	\$40,000	300 gpd	\$12.50
C	Water Main	\$10,000	\$0	\$0
D	Water Main Lift Station	\$10,000	250 gpd	\$10.00
E	Water Main Lift Station, Force Main	\$120,000	300 gpd	\$12.50
F	None	\$0	\$0	\$0
G	None	\$0	\$0	\$0
H	None	\$0	\$0	\$0
I	None	\$0	\$0	\$0
J	Sanitary Main	\$110,000	200 gpd	\$8.00

4 User Impact

Depending on the alternatives selected by the Village of Ceresco and financing of improvements, the average annual revenues needed to support the system will increase. The additional revenue necessary by the Village should be recovered from the local water users in the form of water rates. For the purpose of this evaluation, we have assumed that there are 364 users on the water and sanitary systems.

The following table assumes that no other outside party subsidizes the cost for the improvements to the system. If a source for grant funding or a developer contributes to assist with the project costs, then the impact to the existing users may be reduced. Further, it is assumed that no significant additional O&M costs occur, due to construction of these alternatives.

Table 4-1: Summary of Opinions of Project Costs and Impacts to Users

Area	Recommended Improvements	Estimated Capital Costs	Estimated Debt Service @ 4%/20yr	Average <u>Additional</u> Cost per User per Month (364 Users)
		\$	\$/yr.	\$/ mo.
A	None	-	-	-
B	Booster, Sanitary Main	\$940,000	\$69,167	\$15.83
C	Water Main	\$110,000	\$8,094	\$1.83
D	Water Main, Lift Station Improvements, Sanitary Main,	\$390,000	\$28,697	\$6.57
E	Water Main, Lift Station, Force Main	\$720,000	\$52,979	\$12.13
F	None	-	-	-
G	None	-	-	-
H	None	-	-	-
I	None	-	-	-
J	Sanitary Main	\$110,000	\$8,094	\$1.85

[illegible]

Flow test reports and pump installation record are attached for your reference.
In summary, the rehabilitation was successful.

Please let us know if you have any questions or comments.

Best Regards

Michael E. Judkins
Director – Water Well Services
Office (888) 769-9009
mjudkins@utilityservice.com

Station	Flow (gpm)	Pressure (psi)	Water Level (ft)	Static Head (ft)	Friction Loss (ft)	Total Head (ft)	Efficiency (%)	Notes
1	100	100	100	100	100	100	100	
2	200	200	200	200	200	200	200	
3	300	300	300	300	300	300	300	
4	400	400	400	400	400	400	400	
5	500	500	500	500	500	500	500	
6	600	600	600	600	600	600	600	
7	700	700	700	700	700	700	700	
8	800	800	800	800	800	800	800	
9	900	900	900	900	900	900	900	
10	1000	1000	1000	1000	1000	1000	1000	
11	1100	1100	1100	1100	1100	1100	1100	
12	1200	1200	1200	1200	1200	1200	1200	
13	1300	1300	1300	1300	1300	1300	1300	
14	1400	1400	1400	1400	1400	1400	1400	
15	1500	1500	1500	1500	1500	1500	1500	
16	1600	1600	1600	1600	1600	1600	1600	
17	1700	1700	1700	1700	1700	1700	1700	
18	1800	1800	1800	1800	1800	1800	1800	
19	1900	1900	1900	1900	1900	1900	1900	
20	2000	2000	2000	2000	2000	2000	2000	
21	2100	2100	2100	2100	2100	2100	2100	
22	2200	2200	2200	2200	2200	2200	2200	
23	2300	2300	2300	2300	2300	2300	2300	
24	2400	2400	2400	2400	2400	2400	2400	
25	2500	2500	2500	2500	2500	2500	2500	
26	2600	2600	2600	2600	2600	2600	2600	
27	2700	2700	2700	2700	2700	2700	2700	
28	2800	2800	2800	2800	2800	2800	2800	
29	2900	2900	2900	2900	2900	2900	2900	
30	3000	3000	3000	3000	3000	3000	3000	
31	3100	3100	3100	3100	3100	3100	3100	
32	3200	3200	3200	3200	3200	3200	3200	
33	3300	3300	3300	3300	3300	3300	3300	
34	3400	3400	3400	3400	3400	3400	3400	
35	3500	3500	3500	3500	3500	3500	3500	
36	3600	3600	3600	3600	3600	3600	3600	
37	3700	3700	3700	3700	3700	3700	3700	
38	3800	3800	3800	3800	3800	3800	3800	
39	3900	3900	3900	3900	3900	3900	3900	
40	4000	4000	4000	4000	4000	4000	4000	
41	4100	4100	4100	4100	4100	4100	4100	
42	4200	4200	4200	4200	4200	4200	4200	
43	4300	4300	4300	4300	4300	4300	4300	
44	4400	4400	4400	4400	4400	4400	4400	
45	4500	4500	4500	4500	4500	4500	4500	
46	4600	4600	4600	4600	4600	4600	4600	
47	4700	4700	4700	4700	4700	4700	4700	
48	4800	4800	4800	4800	4800	4800	4800	
49	4900	4900	4900	4900	4900	4900	4900	
50	5000	5000	5000	5000	5000	5000	5000	
51	5100	5100	5100	5100	5100	5100	5100	
52	5200	5200	5200	5200	5200	5200	5200	
53	5300	5300	5300	5300	5300	5300	5300	
54	5400	5400	5400	5400	5400	5400	5400	
55	5500	5500	5500	5500	5500	5500	5500	
56	5600	5600	5600	5600	5600	5600	5600	
57	5700	5700	5700	5700	5700	5700	5700	
58	5800	5800	5800	5800	5800	5800	5800	
59	5900	5900	5900	5900	5900	5900	5900	
60	6000	6000	6000	6000	6000	6000	6000	
61	6100	6100	6100	6100	6100	6100	6100	
62	6200	6200	6200	6200	6200	6200	6200	
63	6300	6300	6300	6300	6300	6300	6300	
64	6400	6400	6400	6400	6400	6400	6400	
65	6500	6500	6500	6500	6500	6500	6500	
66	6600	6600	6600	6600	6600	6600	6600	
67	6700	6700	6700	6700	6700	6700	6700	
68	6800	6800	6800	6800	6800	6800	6800	
69	6900	6900	6900	6900	6900	6900	6900	
70	7000	7000	7000	7000	7000	7000	7000	
71	7100	7100	7100	7100	7100	7100	7100	
72	7200	7200	7200	7200	7200	7200	7200	
73	7300	7300	7300	7300	7300	7300	7300	
74	7400	7400	7400	7400	7400	7400	7400	
75	7500	7500	7500	7500	7500	7500	7500	
76	7600	7600	7600	7600	7600	7600	7600	
77	7700	7700	7700	7700	7700	7700	7700	
78	7800	7800	7800	7800	7800	7800	7800	
79	7900	7900	7900	7900	7900	7900	7900	
80	8000	8000	8000	8000	8000	8000	8000	
81	8100	8100	8100	8100	8100	8100	8100	
82	8200	8200	8200	8200	8200	8200	8200	
83	8300	8300	8300	8300	8300	8300	8300	
84	8400	8400	8400	8400	8400	8400	8400	
85	8500	8500	8500	8500	8500	8500	8500	
86	8600	8600	8600	8600	8600	8600	8600	
87	8700	8700	8700	8700	8700	8700	8700	
88	8800	8800	8800	8800	8800	8800	8800	
89	8900	8900	8900	8900	8900	8900	8900	
90	9000	9000	9000	9000	9000	9000	9000	
91	9100	9100	9100	9100	9100	9100	9100	
92	9200	9200	9200	9200	9200	9200	9200	
93	9300	9300	9300	9300	9300	9300	9300	
94	9400	9400	9400	9400	9400	9400	9400	
95	9500	9500	9500	9500	9500	9500	9500	
96	9600	9600	9600	9600	9600	9600	9600	
97	9700	9700	9700	9700	9700	9700	9700	
98	9800	9800	9800	9800	9800	9800	9800	
99	9900	9900	9900	9900	9900	9900	9900	
100	10000	10000	10000	10000	10000	10000	10000	



Brian Roland
Village of Ceresco
Ref: Aqua Freed Rehabilitation
217 South 2nd Street
Ceresco, NE 68017

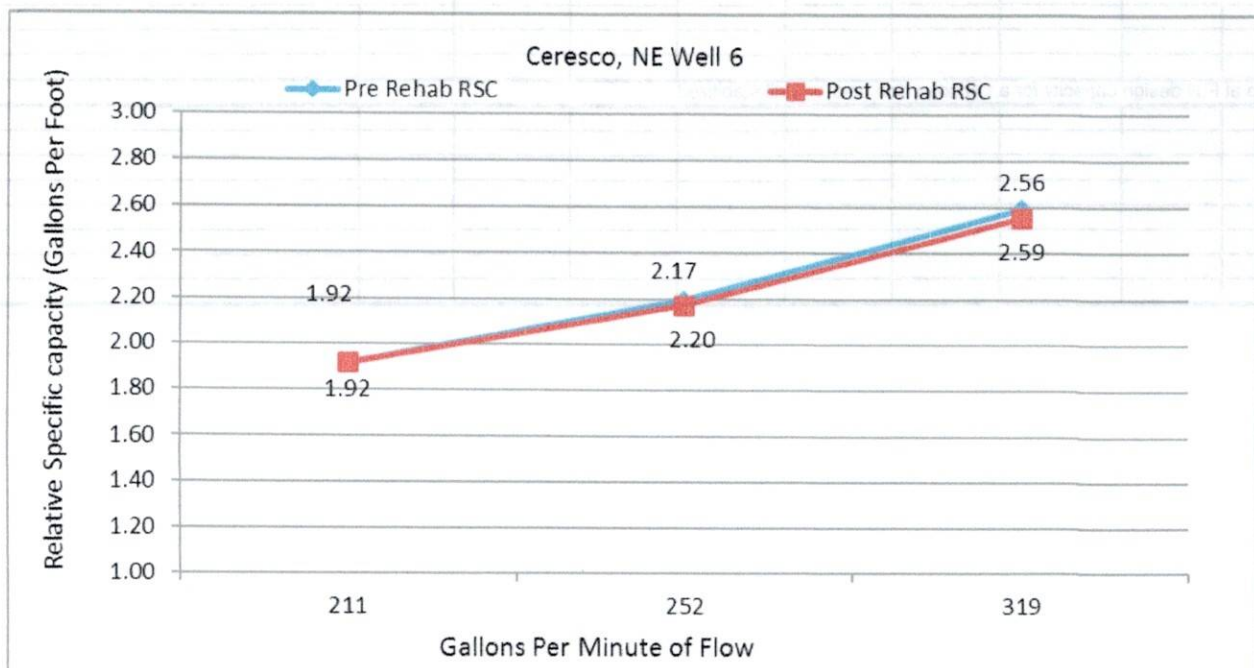
January 16, 2019

Utility Service Company Inc. is pleased to provide the following information associated with the Aqua Freed® Rehabilitation and the installation of the Aqua Gard® Well Maintenance System at Well No 6. The work was completed in August of 2018.

The Aqua Freed® Rehabilitation began with a pump test of the well. The pre-rehabilitation flow test indicated the well was producing 319 GPM at a Relative Specific Capacity of 2.59 gallons per foot.

The pump unit was removed from the well and a video log was performed. The rehabilitation program using the Aqua Freed® technology began with the injection of CO₂. After injection, the injection equipment was removed from the well and redevelopment began. The well was developed using a double disk surge block. The permanent pumping equipment was installed in the well and a pump test was conducted. The results revealed a 2.56 Relative Specific Capacity with a flow rate of 319 GPM.

A rebuilt well cap was installed to accommodate the Aqua Freed® Rehabilitation system. The finished, flanged and bolted cap was coated with an epoxy paint. New pump and motor was installed into the well. Additionally, a new half nipple was installed on the pitless adaptor.



Relative Specific Capacity Calculations



PRE - TREATMENT

[illegible]



Brian Roland
Ref: Annual Pump Test Report
Village of Ceresco
217 South 2nd Street
Ceresco, NE 68017

January 16, 2019

Utility Service Company Inc. is pleased to provide the following information associated with the annual pump testing of Well 5. The work was completed in August of 2018.

The testing could not be completed because of a leaking pitless adaptor. Future pump test will occur in fall of 2019.

Please let us know if you have any questions or comments.

Pump test report is attached for your records.

Best Regards

Michael E. Judkins
Director – Water Well Services
Office (920) 474-4777
mjudkins@utilityservice.com

PRE - TREATMENT

[illegible]



Brian Roland
Ref: Annual Pump Test Report
Village of Ceresco
217 South 2nd Street
Ceresco, NE 68017

January 16, 2019

Utility Service Company Inc. is pleased to provide the following information associated with the annual pump testing of Well 4. The work was completed in August of 2018.

The testing indicates the current pumping characteristics of the well. The well is producing 181 gallons per minute with a relative specific capacity of 1.84 gpm/feet.

Please let us know if you have any questions or comments.

Pump test report is attached for your records.

Best Regards

Michael E. Judkins
Director – Water Well Services
Office (920) 474-4777
mjudkins@utilityservice.com

Sargent Drilling
INDUSTRIAL ENGINEERING
COMPLETE MUNICIPAL AND INDUSTRIAL
WELL AND PUMP SERVICE

PO Box 367
846 South 13th St.

Geneva, NE
68361

Phone 402 759-3902
Fax 402 759-4960

SARGENT PUMP TEST

DATE: 4/11/03

OWNER: City of Ceresco

OPERATER: Don

CITY: Ceresco

STATE: Nebraska

WELL #: West

WELL ID#:

GPS N-LATITUDE: - -

W-LONGITUDE: - -

MOTOR MFG: Franklin

HP: 15 FRAME: N/A MOTOR EFFICIENCY: 81 %

PUMP MFG: Grundfos

SETTING: 140 Ft. 4 X Sub BOWL: 8 Stage 150S150

STATIC W. L.(Ft.): 84

DESIGN SP (GPM/Ft. DD): 0

SHUT OFF (PSI): 146

CONDITION	TEST #1	TEST #2	TEST #3
Pump RPM	3450	3450	3450
Pumping Pressure (PSI)	40	50	60
Pump Loss (Ft.)	7.59	6.78	6.15
Pumping Level (Ft.)	100	99	98
TDH (Ft.)	199.99	221.28	242.75
GPM: Meter	185	175	170
GPM: Test Equipment	188	177	168
Water HP	9.49	9.89	10.3
SP Capacity (GPM/Ft.)	11.8	11.8	12
KW	14.2	14.2	14.2
Input HP	19.03	19.03	19.03
Pump HP	15.42	15.42	15.42
Wire To Water (%)	49.9	52	54.1
Pump Efficiency (%)	61.5	64.1	66.8

Sargent Drilling

INDUSTRIAL ENGINEERING

COMPLETE MUNICIPAL AND INDUSTRIAL WELL AND PUMP SERVICE

PO Box 367
846 South 13th St.

Geneva, NE
68361

Phone 402 759-3902
Fax 402 759-4960

SARGENT PUMP TEST

DATE: 4/11/03 OWNER: City of Ceresco OPERATER: Don

CITY: Ceresco STATE: Nebraska WELL #: East WELL ID#:

GPS N-LATITUDE: - - W-LONGITUDE: - -

MOTOR MFG: Franklin HP: 15 FRAME: 6 In. MOTOR EFFICIENCY: 81.5 %

PUMP MFG: Grundfos SETTING: 105 Ft. 4 X Sub BOWL: 8 Stage 150S150

STATIC W. L.(Ft.): 49 DESIGN SP (GPM/Ft. DD): 0 SHUT OFF (PSI): 143

CONDITION	TEST #1	TEST #2	TEST #3
Pump RPM	3490	3490	3490
Pumping Pressure (PSI)	40	50	60
Pump Loss (Ft.)	5.2	4.82	4.45
Pumping Level (Ft.)	75	73.5	71.5
TDH (Ft.)	172.6	193.82	214.55
GPM: Meter	181	178	163
GPM: Test Equipment	175	168	161
Water HP	7.63	8.22	8.72
SP Capacity (GPM/Ft.)	6.7	6.9	7.2
KW	14	13.9	13.9
Input HP	18.77	18.63	18.63
Pump HP	15.29	15.19	15.19
Wire To Water (%)	40.6	44.1	46.8
Pump Efficiency (%)	49.9	54.1	57.4

Sargent Drilling
INDUSTRIAL ENGINEERING
COMPLETE MUNICIPAL AND INDUSTRIAL
WELL AND PUMP SERVICE

PO Box 367
846 South 13th St.

Geneva, NE
68361

Phone 402 759-3902
Fax 402 759-4960

SARGENT PUMP TEST

DATE: 4/11/03

OWNER: City of Ceresco

OPERATER: Don

CITY: Ceresco

STATE: Nebraska

WELL #: North

WELL ID#:

GPS N-LATITUDE: - -

W-LONGITUDE: - -

MOTOR MFG: Franklin

HP: 40

FRAME: N/A

MOTOR EFFICIENCY: 83.4 %

PUMP MFG: Grundfos

SETTING: 190 Ft. 4 X Sub

BOWL: 9 Stage 300 S 400

STATIC W. L.(Ft.): 94

DESIGN SP (GPM/Ft. DD): 0

SHUT OFF (PSI): 200 +

CONDITION	TEST #1	TEST #2	TEST #3
Pump RPM	3450	3450	3450
Pumping Pressure (PSI)	70	50	60
Pump Loss (Ft.)	26.63	30.83	28.69
Pumping Level (Ft.)	126.5	129	127
TDH (Ft.)	314.83	275.33	294.29
GPM: Meter	0	0	360
GPM: Test Equipment	319	345	332
Water HP	25.36	23.99	24.67
SP Capacity (GPM/Ft.)	9.8	9.9	10.1
KW	32.2	31.8	32
Input HP	43.16	42.63	42.9
Pump HP	36	35.55	35.77
Wire To Water (%)	58.8	56.3	57.5
Pump Efficiency (%)	70.4	67.5	69

Sargent Drilling

INDUSTRIAL ENGINEERING
COMPLETE MUNICIPAL, INDUSTRIAL AND AGRICULTURAL
PUMP AND WELL SERVICE

P.O. Box 367
846 S. 13th Street
Geneva, NE 68361-0367

Phone: (402) 759-3902
Toll Free: (888) 496-3902
Fax: (402) 759-4960

April 24, 2003

City of Ceresco
PO Box 160
Ceresco, NE 68017-0160

RE: 2003 well and pump test results

Attention: Don Newsham and Honorable Board Members:

Sargent Drilling performed well and pump tests in your community and this letter is a summary of the results:

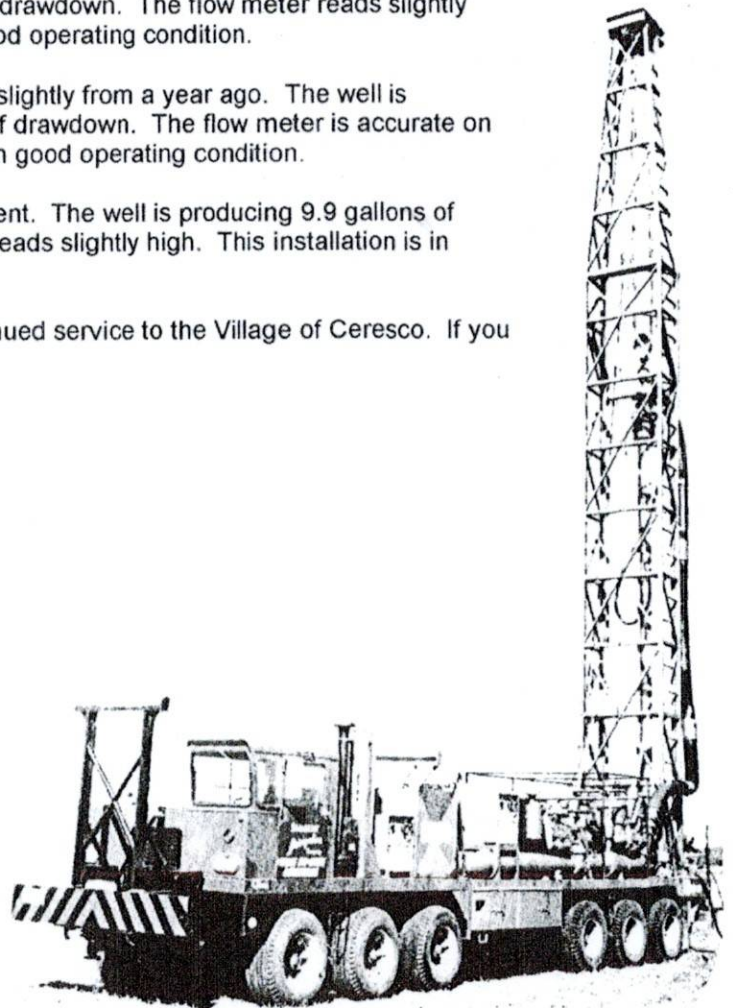
- East Well #5: The pump efficiency is 54%; this is down slightly from a year ago. The well is producing 6.9 gallons of water per foot of drawdown. The flow meter reads slightly high. This installation appears to be in good operating condition.
- West Well #4: The pump efficiency is 64%; this is down slightly from a year ago. The well is producing 11.9 gallons of water per foot of drawdown. The flow meter is accurate on this well. This installation appears to be in good operating condition.
- North Well: The pump efficiency is 69%; this is excellent. The well is producing 9.9 gallons of water per foot of draw down. The meter reads slightly high. This installation is in excellent operating condition.

Sargent Drilling appreciates the opportunity to be of continued service to the Village of Ceresco. If you have any questions, please feel free to contact my office.

Thank you,


Doug Yantzie,
Superintendent.

DY/dm



Appendix E: Pump Tests

1. Pump Test 1
2. Pump Test 2
3. Pump Test 3

1. Pump Test 1
2. Pump Test 2
3. Pump Test 3

1. Pump Test 1

1. Pump Test 1
2. Pump Test 2
3. Pump Test 3

1. Pump Test 1

1. Pump Test 1

1. Pump Test 1

1. Pump Test 1

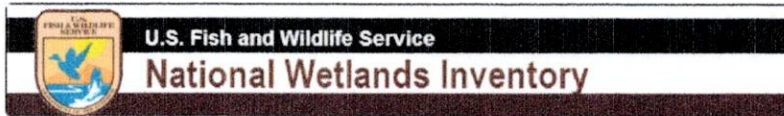
1. Pump Test 1

1. Pump Test 1

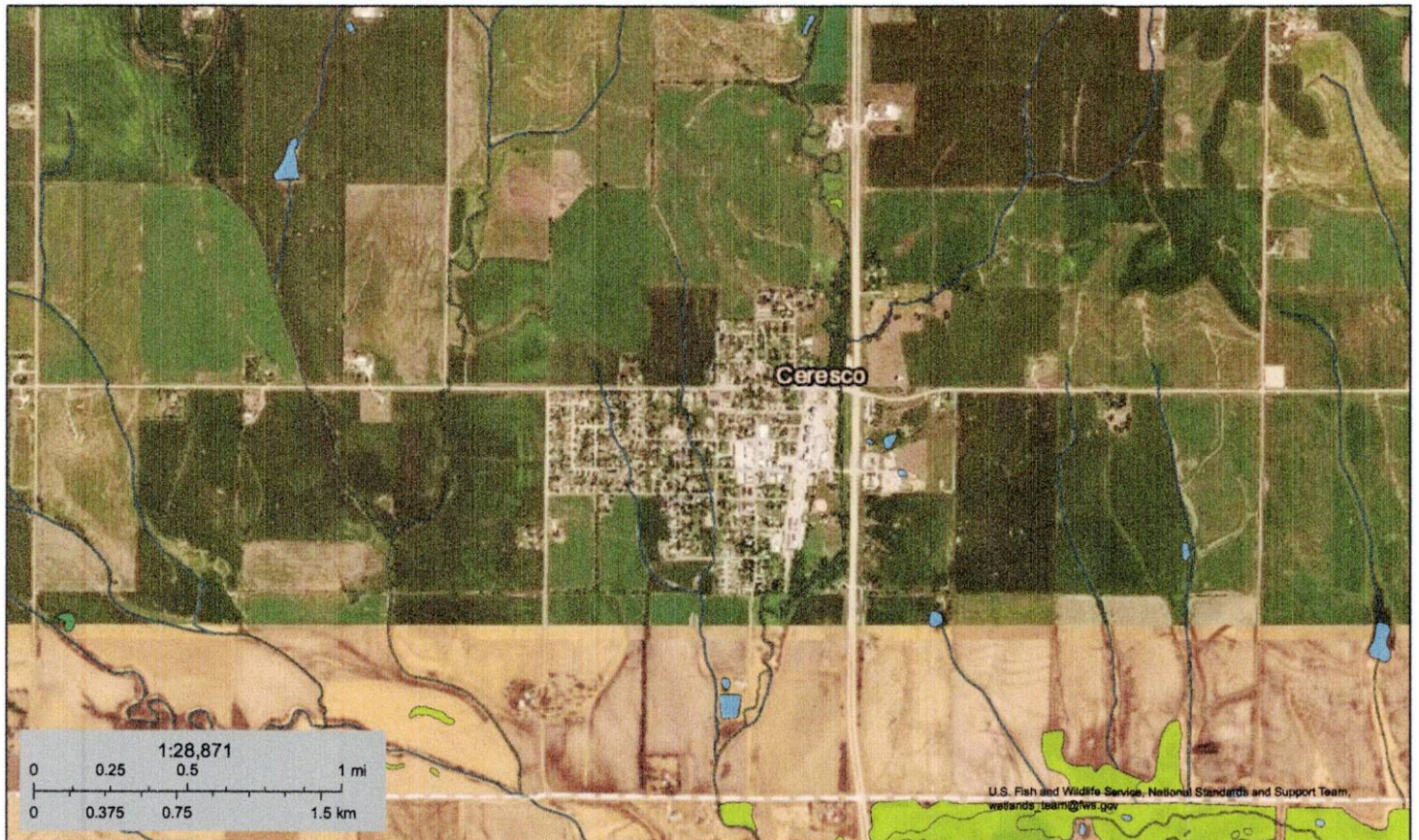
1. Pump Test 1

1. Pump Test 1

1. Pump Test 1



Wetlands



December 19, 2018

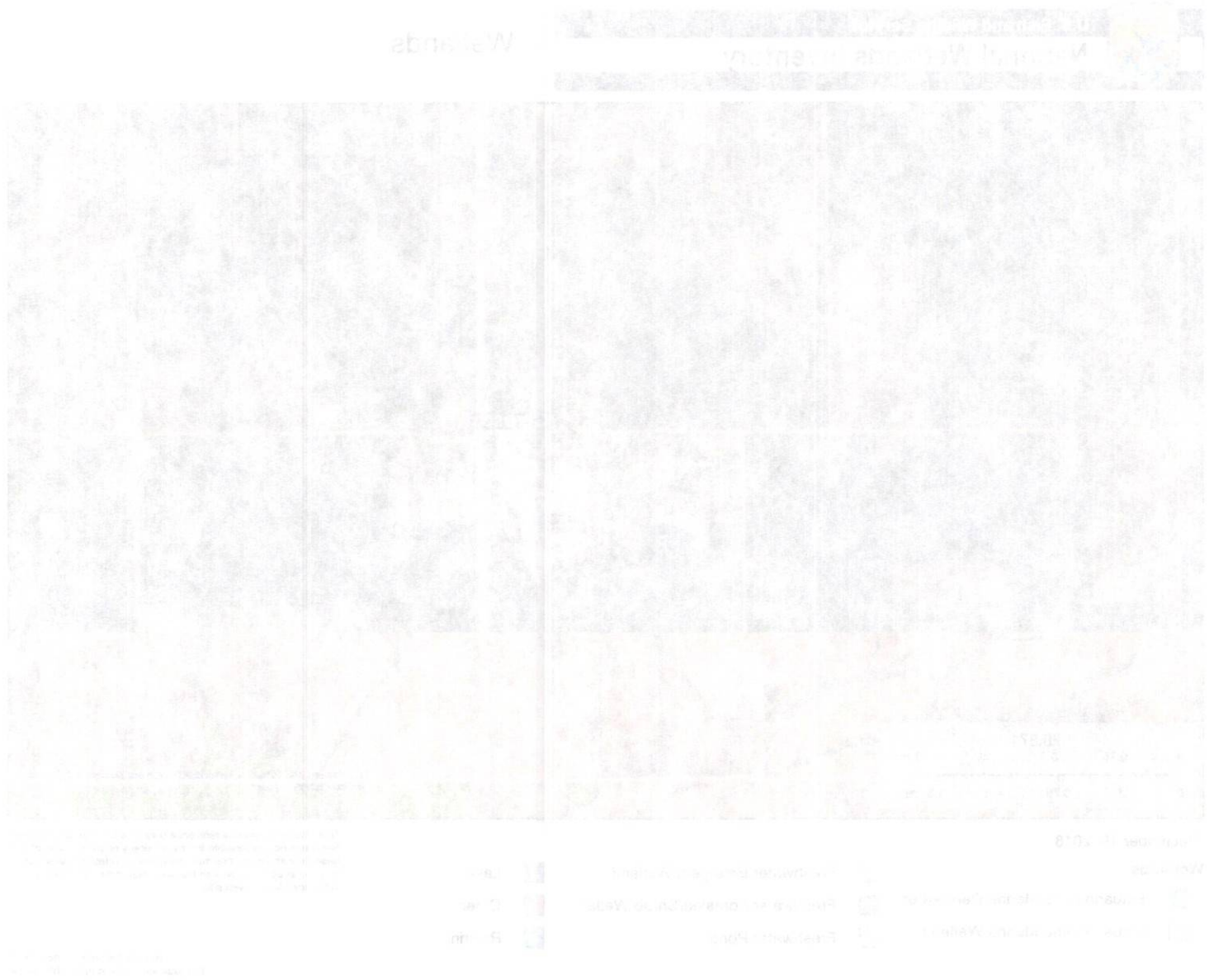
Wetlands

- | | | |
|--------------------------------|-----------------------------------|----------|
| Estuarine and Marine Deepwater | Freshwater Emergent Wetland | Lake |
| Estuarine and Marine Wetland | Freshwater Forested/Shrub Wetland | Other |
| Freshwater Pond | | Riverine |

This map is for general reference only. The US Fish and Wildlife Service is not responsible for the accuracy or currentness of the base data shown on this map. All wetlands related data should be used in accordance with the layer metadata found on the Wetlands Mapper web site.

National Wetlands Inventory (NWI)
This page was produced by the NWI mapper

Appendix D: Ceresco Wetlands Map





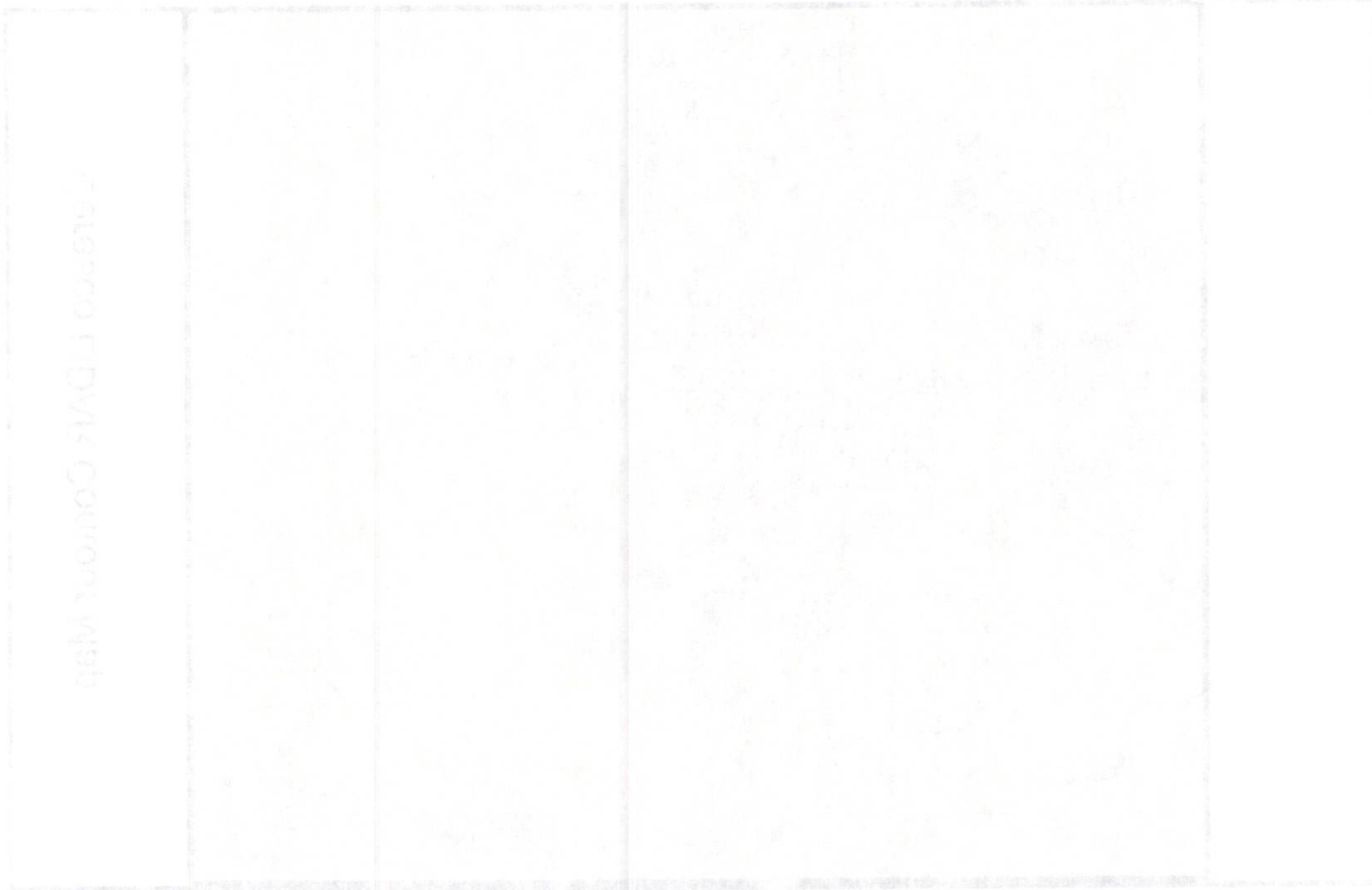
Appendix C: DNR Floodplain Section Map

Ceresco LiDAR Contour Map



Appendix B: Ceresco LiDAR Contour Map

Appendix B: Ceresco LiDAR Contour Map





4000 ft

A

US HWY 77

18

77

Park St

Cameron St

Edwin St

Main St

Spruce St

Beech St

1st St

Ceresco

Pine St

Oak St

Ash St

4th St

5th Ave

Laura Ln

7th St

S 8th St

S 2nd St

2nd St

Precinct Rd

19

Google Earth

© 2018 Google

Appendix A: Aerial Photograph

APPENDIX

Document Name	# of Pages
Appendix A: Aerial Photograph.....	1
Appendix B: Ceresco LiDAR Contour Map	1
Appendix C: DNR Floodplain Section Map	1
Appendix D: Ceresco Wetlands Map	1
Appendix E: Pump Tests.....	13
Appendix F: Well and WWTF Annual Flow Data and Design Flows	8
Appendix G: Water System Layout	1
Appendix H: Historical Village Maps	5
Appendix I: Property Elevations and Boundaries	1
Appendix J: Ceresco Zoning Map	1
Appendix K: Flow Calculations	2
Appendix L: Hunter Addition	1
Appendix M: Opinions of Probable Costs	2

**THIS CONCLUDES THE
PRELIMINARY ENGINEERING REPORT
FOR THE
PUBLIC WATER SYSTEM
VILLAGE OF CERESCO, NEBRASKA**

Well No.:	6	Owner:	Ceresco, NE	Date:	8/27/2018
Well Depth (feet):	231	Test/Permanent Pump:			
Pump Setting Depth (feet):		Top of Casing (feet):		Static Water Level (feet):	91
SUEZ Service Center:	Central Wells	Tested By:	Austin/Randy		

[illegible]



SUBMERSIBLE PUMP DATA

Customer Ceresco
Well No 6
Project No. 138557
Date 8/27/18

PITLESS ADAPTER

Make Baker
Size 16"
Depth of Discharge 8' pull pipe

SURFACE

Type _____
Size _____

WELL SEAL

Type 18" flanged CO2 head
Size _____

MOTOR

Make Hitachi
HP 40 RPM 3470
Phase 3 FLA 61
Voltage 460
Model # Date-E18C
Serial # G27453E

PUMP

MFG. Grundfos 300S400-9
Model _____ Stg. 9
GPM 300 TDH _____
Length 5'
Bowl Material Stainless Steel
Impeller _____
Bowl Bearings _____
Wear Rings _____
Serial # 24-18-280
Airline Mat'l _____
Length _____

CABLE

Size #4
Length 200'
Type Flat Jacket

WELL DATA

Inside Diameter 13.8 PVC
Well Depth from Grade 231
Pump Setting Above Grade _____
Diameter of Screen 16"
Screen Length 20'
Slot _____
Gravel Pack _____ Tubular _____
Size of Gravel Pack _____

RISER

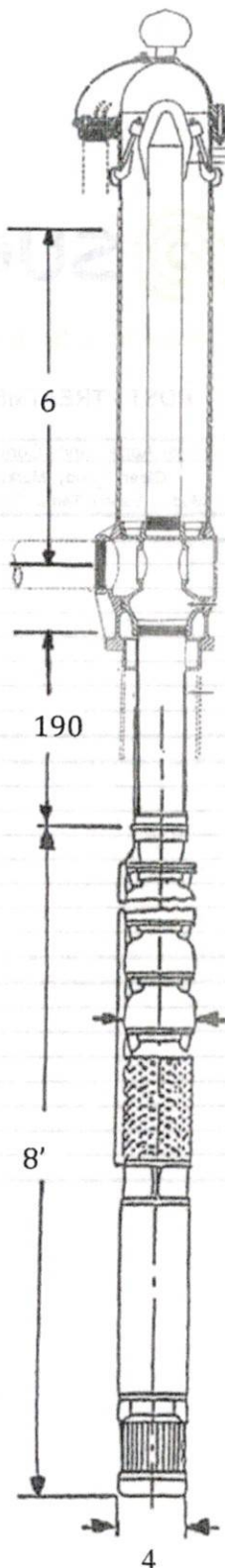
Size Pipe 6" Certalock
Section Lengths 9-20'/1-10'
Spec Coating _____
Check Valves Yes _____ Ft.

PUMP TEST DATA

Pump Test Data Date: 10/11/18
Static Level 46 Ft.
Capacity (GPM) _____ Pumping Level _____
60 76 Ft.
75 88 Ft.

COMMENTS

Welded on new 8" Heavy Duty Half nipple on bottom of pitless
with 55 nickel rod



Physical Data

Present Loadings

Flow, MGD	0.075
BOD ₅ , mg/L	219
Suspended Solids, mg/L	219
Population, present	720

Design Loadings

Flow, MGD	
Average	0.115
Minimum	0.03
Maximum	0.287
BOD ₅ , lbs/day	210
Population	1,150

Comminutor

Flow Capacity, MGD	0 - 0.575
Bypass	Bar Screen

Parshall Flume

Flume Size, in.	3-Inch
Capacity, MGD	0.018 - 1.2
Level Measurement	Ultrasonic Level Sensing

Aeration Channel

Capacity, gal.	148,545
Depth, ft.	17
Detention Time, Design	31 hrs.
Loading, lbs, BOD/1000 ft ³ (16 hr. loading rate)	10.2
Fine Bubble Diffusers (ea)	2
Blowers, ea.	4
Capacity, CFM	34

Clarifier

Dimension, Diameter, ft.	22
Area, surface, ft ²	380
Liquid Depth, ft.	12
Capacity, gal.	33,630
Detention Time, hr.	7.0
Design @ 100% return rate	3.1
Max. Flow @ 100% return rate	1.4
Weir Length, ft.	30
Surface Settling Rate, gpd/ft ²	
Design	303
Max. Flow	755
Floor Slope, in/ft.	1

007-0537

Ceresco WWTP

Annual Flow Report

Year	Month	Day	Influent Flow	RAS Flow	Well 4 Flow
2014			1.548 MG	2.297 MG	0.324 MG
2015			18.035 MG	27.246 MG	4.693 MG
2016			20.561 MG	21.566 MG	5.045 MG
	January		1.729 MG	1.799 MG	0.350 MG
	February		1.628 MG	1.778 MG	0.217 MG
	March		1.521 MG	2.119 MG	0.147 MG
	April		1.707 MG	1.815 MG	0.423 MG
	May		2.368 MG	2.501 MG	0.450 MG
	June		1.765 MG	1.752 MG	0.674 MG
	July		1.707 MG	1.697 MG	0.684 MG
	August		1.586 MG	1.575 MG	0.500 MG
	September		1.662 MG	1.656 MG	0.452 MG
	October		1.771 MG	1.765 MG	0.404 MG
	November		1.548 MG	1.540 MG	0.405 MG
	December		1.569 MG	1.568 MG	0.339 MG
2017			17.783 MG	23.041 MG	5.638 MG
2018			15.904 MG	23.176 MG	5.663 MG

Well 5 Flow	Well 6 Flow
0.310 MG	1.063 MG
5.485 MG	17.323 MG
5.409 MG	16.767 MG
0.335 MG	1.164 MG
0.402 MG	1.049 MG
0.564 MG	1.028 MG
0.387 MG	1.295 MG
0.409 MG	1.378 MG
0.661 MG	2.146 MG
0.642 MG	2.125 MG
0.449 MG	1.517 MG
0.423 MG	1.392 MG
0.415 MG	1.316 MG
0.396 MG	1.284 MG
0.326 MG	1.072 MG
6.859 MG	19.135 MG
5.380 MG	16.759 MG

Ceresco WWTP

Annual Flow Report

Year	Month	Day	Influent Flow	RAS Flow	Well 4 Flow
2014			1.548 MG	2.297 MG	0.324 MG
2015			18.035 MG	27.246 MG	4.693 MG
2016			20.561 MG	21.566 MG	5.045 MG
2017			17.783 MG	23.041 MG	5.638 MG
	January		1.526 MG	1.528 MG	0.306 MG
	February		1.382 MG	1.520 MG	0.297 MG
	March		1.435 MG	1.424 MG	0.359 MG
	April		1.342 MG	1.473 MG	0.413 MG
	May		1.779 MG	2.045 MG	0.435 MG
	June		1.624 MG	1.911 MG	0.682 MG
	July		1.496 MG	2.382 MG	0.716 MG
	August		1.456 MG	2.068 MG	0.559 MG
	September		1.416 MG	2.334 MG	0.471 MG
	October		1.589 MG	2.297 MG	0.444 MG
	November		1.273 MG	1.994 MG	0.528 MG
	December		1.465 MG	2.064 MG	0.427 MG
2018			15.904 MG	23.176 MG	5.663 MG

Well 5 Flow	Well 6 Flow
0.310 MG	1.063 MG
5.485 MG	17.323 MG
5.409 MG	16.767 MG
6.859 MG	19.135 MG
0.320 MG	0.990 MG
0.280 MG	0.930 MG
0.377 MG	1.187 MG
0.325 MG	1.080 MG
0.416 MG	1.389 MG
0.643 MG	2.161 MG
0.736 MG	2.376 MG
0.580 MG	1.868 MG
1.795 MG	2.637 MG
0.450 MG	1.458 MG
0.494 MG	1.658 MG
0.442 MG	1.401 MG
5.380 MG	16.759 MG

Ceresco WWTP

Annual Flow Report

Year	Month	Day	Influent Flow	RAS Flow	Well 4 Flow
2014			1.548 MG	2.297 MG	0.324 MG
2015			18.035 MG	27.246 MG	4.693 MG
2016			20.561 MG	21.566 MG	5.045 MG
2017			17.783 MG	23.041 MG	5.638 MG
2018			15.904 MG	23.176 MG	5.663 MG
	January		1.399 MG	1.841 MG	0.385 MG
	February		1.180 MG	1.972 MG	0.322 MG
	March		1.286 MG	2.010 MG	0.379 MG
	April		1.333 MG	2.185 MG	0.401 MG
	May		1.331 MG	2.301 MG	0.569 MG
	June		1.291 MG	2.259 MG	0.623 MG
	July		1.370 MG	2.240 MG	0.639 MG
	August		1.417 MG	2.631 MG	0.699 MG
	September		1.671 MG	1.338 MG	0.926 MG
	October		1.597 MG	1.988 MG	0.300 MG
	November		1.484 MG	1.834 MG	0.317 MG
	December		0.544 MG	0.576 MG	0.103 MG

Well 5 Flow	Well 6 Flow
0.310 MG	1.063 MG
5.485 MG	17.323 MG
5.409 MG	16.767 MG
6.859 MG	19.135 MG
5.380 MG	16.759 MG
0.362 MG	1.211 MG
0.292 MG	1.207 MG
0.355 MG	1.203 MG
0.367 MG	1.243 MG
0.534 MG	1.794 MG
0.597 MG	1.980 MG
0.567 MG	1.910 MG
0.804 MG	1.502 MG
0.839 MG	1.895 MG
0.290 MG	1.218 MG
0.294 MG	1.223 MG
0.079 MG	0.373 MG

Home > CerescoReports > AnnualFlow

Home | Site Settings | Help

1 of 1 100% Find | Next

Ceresco WWTP

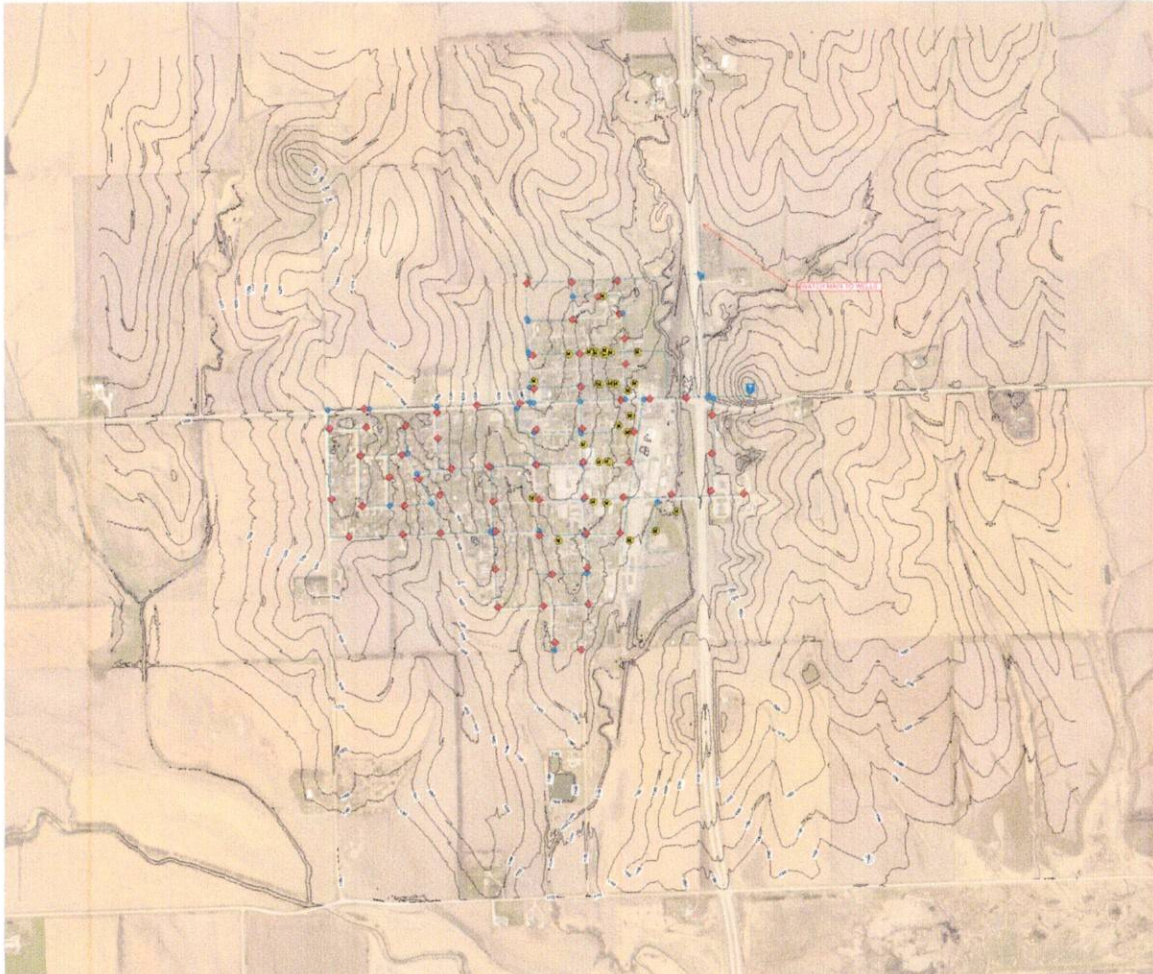
Annual Flow Report

Year	Month	Day	Influent Flow	RAS Flow	Well 4 Flow	Well 5 Flow
2014			1.548 MG	2.297 MG	0.324 MG	0.310 MG
2015			18.035 MG	27.246 MG	4.693 MG	5.485 MG
2016			20.561 MG	21.566 MG	5.045 MG	5.409 MG
	January		1.729 MG	1.799 MG	0.350 MG	0.335 MG
	February		1.628 MG	1.778 MG	0.217 MG	0.402 MG
	March		1.521 MG	2.119 MG	0.147 MG	0.564 MG
	April		1.707 MG	1.815 MG	0.423 MG	0.387 MG
	May		2.368 MG	2.501 MG	0.450 MG	0.409 MG
	June		1.765 MG	1.752 MG	0.674 MG	0.661 MG
	July		1.707 MG	1.697 MG	0.684 MG	0.642 MG
	August		1.586 MG	1.575 MG	0.500 MG	0.449 MG
	September		1.662 MG	1.656 MG	0.452 MG	0.423 MG
	October		1.771 MG	1.765 MG	0.404 MG	0.415 MG
	November		1.548 MG	1.540 MG	0.405 MG	0.396 MG
	December		1.569 MG	1.568 MG	0.339 MG	0.326 MG
2017			17.783 MG	23.041 MG	5.638 MG	6.859 MG
2018			15.904 MG	23.176 MG	5.663 MG	5.380 MG

Appendix G: Water System Layout

Line #	From	To	Flow at	Notes
1	1000000	1000000	0.00	Water Main
2	1000000	1000000	0.00	Water Main
3	1000000	1000000	0.00	Water Main
4	1000000	1000000	0.00	Water Main
5	1000000	1000000	0.00	Water Main
6	1000000	1000000	0.00	Water Main
7	1000000	1000000	0.00	Water Main
8	1000000	1000000	0.00	Water Main
9	1000000	1000000	0.00	Water Main
10	1000000	1000000	0.00	Water Main
11	1000000	1000000	0.00	Water Main
12	1000000	1000000	0.00	Water Main
13	1000000	1000000	0.00	Water Main
14	1000000	1000000	0.00	Water Main
15	1000000	1000000	0.00	Water Main
16	1000000	1000000	0.00	Water Main
17	1000000	1000000	0.00	Water Main
18	1000000	1000000	0.00	Water Main
19	1000000	1000000	0.00	Water Main
20	1000000	1000000	0.00	Water Main
21	1000000	1000000	0.00	Water Main
22	1000000	1000000	0.00	Water Main
23	1000000	1000000	0.00	Water Main
24	1000000	1000000	0.00	Water Main
25	1000000	1000000	0.00	Water Main
26	1000000	1000000	0.00	Water Main
27	1000000	1000000	0.00	Water Main
28	1000000	1000000	0.00	Water Main
29	1000000	1000000	0.00	Water Main
30	1000000	1000000	0.00	Water Main
31	1000000	1000000	0.00	Water Main
32	1000000	1000000	0.00	Water Main
33	1000000	1000000	0.00	Water Main
34	1000000	1000000	0.00	Water Main
35	1000000	1000000	0.00	Water Main
36	1000000	1000000	0.00	Water Main
37	1000000	1000000	0.00	Water Main
38	1000000	1000000	0.00	Water Main
39	1000000	1000000	0.00	Water Main
40	1000000	1000000	0.00	Water Main
41	1000000	1000000	0.00	Water Main
42	1000000	1000000	0.00	Water Main
43	1000000	1000000	0.00	Water Main
44	1000000	1000000	0.00	Water Main
45	1000000	1000000	0.00	Water Main
46	1000000	1000000	0.00	Water Main
47	1000000	1000000	0.00	Water Main
48	1000000	1000000	0.00	Water Main
49	1000000	1000000	0.00	Water Main
50	1000000	1000000	0.00	Water Main
51	1000000	1000000	0.00	Water Main
52	1000000	1000000	0.00	Water Main
53	1000000	1000000	0.00	Water Main
54	1000000	1000000	0.00	Water Main
55	1000000	1000000	0.00	Water Main
56	1000000	1000000	0.00	Water Main
57	1000000	1000000	0.00	Water Main
58	1000000	1000000	0.00	Water Main
59	1000000	1000000	0.00	Water Main
60	1000000	1000000	0.00	Water Main
61	1000000	1000000	0.00	Water Main
62	1000000	1000000	0.00	Water Main
63	1000000	1000000	0.00	Water Main
64	1000000	1000000	0.00	Water Main
65	1000000	1000000	0.00	Water Main
66	1000000	1000000	0.00	Water Main
67	1000000	1000000	0.00	Water Main
68	1000000	1000000	0.00	Water Main
69	1000000	1000000	0.00	Water Main
70	1000000	1000000	0.00	Water Main
71	1000000	1000000	0.00	Water Main
72	1000000	1000000	0.00	Water Main
73	1000000	1000000	0.00	Water Main
74	1000000	1000000	0.00	Water Main
75	1000000	1000000	0.00	Water Main
76	1000000	1000000	0.00	Water Main
77	1000000	1000000	0.00	Water Main
78	1000000	1000000	0.00	Water Main
79	1000000	1000000	0.00	Water Main
80	1000000	1000000	0.00	Water Main
81	1000000	1000000	0.00	Water Main
82	1000000	1000000	0.00	Water Main
83	1000000	1000000	0.00	Water Main
84	1000000	1000000	0.00	Water Main
85	1000000	1000000	0.00	Water Main
86	1000000	1000000	0.00	Water Main
87	1000000	1000000	0.00	Water Main
88	1000000	1000000	0.00	Water Main
89	1000000	1000000	0.00	Water Main
90	1000000	1000000	0.00	Water Main
91	1000000	1000000	0.00	Water Main
92	1000000	1000000	0.00	Water Main
93	1000000	1000000	0.00	Water Main
94	1000000	1000000	0.00	Water Main
95	1000000	1000000	0.00	Water Main
96	1000000	1000000	0.00	Water Main
97	1000000	1000000	0.00	Water Main
98	1000000	1000000	0.00	Water Main
99	1000000	1000000	0.00	Water Main
100	1000000	1000000	0.00	Water Main

Appendix H: Historical Village Map



GRAPHIC SCALE
0 10 20
UNIT OF MEASURE: 10 FEET



Water System

- ◆ Hydrants
- ◆ Hydrant_Valves
- Valves
- Wells
- Water_Tower
- Meters
- Mains
 - 2
 - 4
 - 6
 - 8
 - 10

Approximate Lengths
10" - 10,000'
8" - 8,500'
6" - 18,500'
4" - 2,000'
2" - 2,000'

2018 WATER AND SEWER STUDY
VILLAGE OF CERESCO, NEBRASKA

WATER SYSTEM BASE AND CONTOURS

PRELIMINARY
NOT FOR CONSTRUCTION

DATE
11/26/2018

PROJECT NO: 181201
DATE: 11/26/2018
DRAWN BY: JAS
CHECKED BY: JAS
DESIGNED BY: JAS
APPROVED BY: JAS
PROJECT NO: 181201
DATE: 11/26/2018
DRAWN BY: JAS
CHECKED BY: JAS
DESIGNED BY: JAS
APPROVED BY: JAS

WATER

Appendix H: Historical Village Maps



LOCATION
 29 - 13 - 7
 32 - 13 - 7
 SEC - 13P - RCE



SECTION LOCATION

1	2	3	4	5	6	7	8	9	10	11	12
13	14	15	16	17	18	19	20	21	22	23	24

SECTION BREAKDOWN

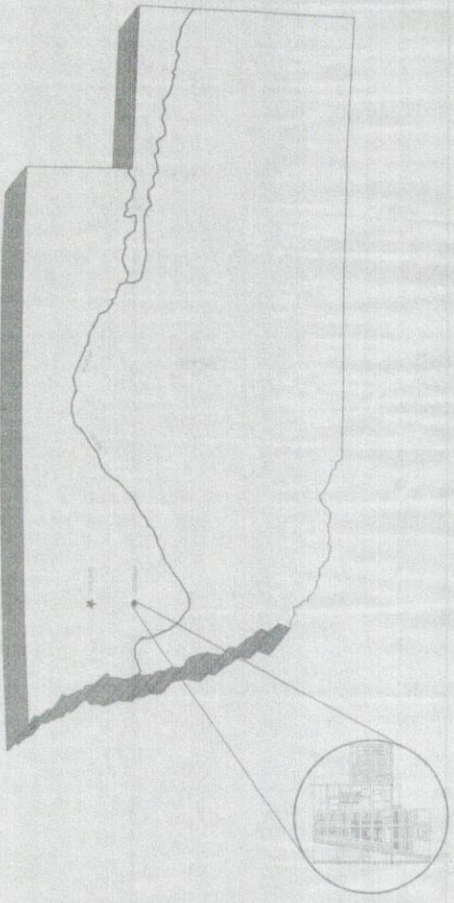
1	2	3	4
5	6	7	8
9	10	11	12
13	14	15	16
17	18	19	20
21	22	23	24

VILLAGE MAPS

CERESCO

SAUNDERS COUNTY NEBRASKA

1993



NOTE:
 ALL INFORMATION USED FOR THE PREPARATION OF
 THIS MAP WAS TAKEN FROM PREVIOUSLY EXISTING MAPS
 AND PLANS PROVIDED BY THE VILLAGE OF CERESCO.
 THE VILLAGE OF CERESCO IS LOCATED IN SAUNDERS COUNTY
 NEBRASKA.

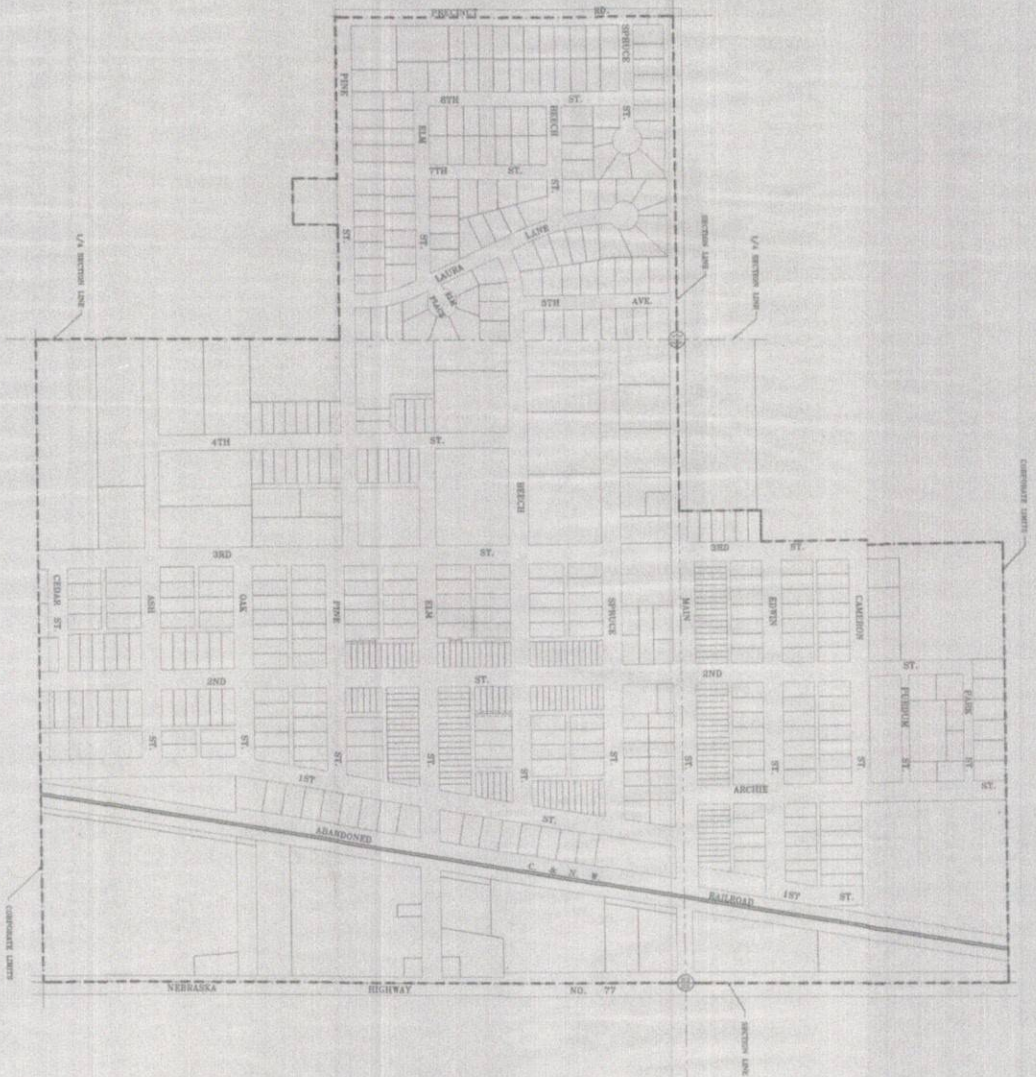
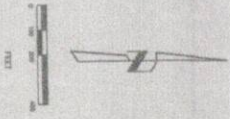
INDEX OF DRAWINGS

DRAWING NO.	TITLE
SHEET 1 OF 6	COVER SHEET/
SHEET 2 OF 6	LOCATION MAP
SHEET 3 OF 6	BASE MAP
SHEET 4 OF 6	PLAT MAP
SHEET 5 OF 6	SEWER SYSTEM MAP
SHEET 6 OF 6	WATER SYSTEM MAP
SHEET 7 OF 6	ZONING MAP



BASE MAP VILLAGE OF CERESCO SAUNDERS COUNTY NEBRASKA 1993

NOTE:
ALL INFORMATION USED FOR THE PREPARATION OF
THIS MAP WAS OBTAINED FROM PREVIOUSLY EXISTING MAPS
AND PLATS PROVIDED BY THE VILLAGE OF CERESCO,
OR FROM INFORMATION ON FILE IN THE SAUNDERS COUNTY
COURTHOUSE.



SHEET
2 OF 6

Map of the Village of Ceresco, Nebraska, 1993. The map shows the street layout and boundaries of the village. The map is a base map and does not show any other information.

CERESCO,
NEBRASKA
1993

BASE
MAP

Copyright, 1993, by
Olsson Associates, Inc.
All rights reserved.
Map No. 100-1000
Map No. 100-1001

OLSSON
ASSOCIATES

PLAT MAP VILLAGE OF CERESCO SAUNDERS COUNTY NEBRASKA 1993

PLAT MAP LEGEND

CURVE DATA

- HEAVY DASHED LINES INDICATE AREAS WHERE PLATTED DIMENSIONS DO NOT PLAT CORRECTLY WITHIN THE PLAT MAP.
- AREAS OF VACATED ALLOTS OR STREETS
- ① 0.5 - 0.99 AC
 - ② 1.0 - 1.99 AC
 - ③ 2.0 - 2.99 AC
 - ④ 3.0 - 3.99 AC
 - ⑤ 4.0 - 4.99 AC
 - ⑥ 5.0 - 5.99 AC
 - ⑦ 6.0 - 6.99 AC
 - ⑧ 7.0 - 7.99 AC
 - ⑨ 8.0 - 8.99 AC
 - ⑩ 9.0 - 9.99 AC
 - ⑪ 10.0 - 10.99 AC
 - ⑫ 11.0 - 11.99 AC
 - ⑬ 12.0 - 12.99 AC
 - ⑭ 13.0 - 13.99 AC
 - ⑮ 14.0 - 14.99 AC
 - ⑯ 15.0 - 15.99 AC
 - ⑰ 16.0 - 16.99 AC
 - ⑱ 17.0 - 17.99 AC
 - ⑲ 18.0 - 18.99 AC
 - ⑳ 19.0 - 19.99 AC
 - ㉑ 20.0 - 20.99 AC
 - ㉒ 21.0 - 21.99 AC
 - ㉓ 22.0 - 22.99 AC
 - ㉔ 23.0 - 23.99 AC
 - ㉕ 24.0 - 24.99 AC
 - ㉖ 25.0 - 25.99 AC
 - ㉗ 26.0 - 26.99 AC
 - ㉘ 27.0 - 27.99 AC
 - ㉙ 28.0 - 28.99 AC
 - ㉚ 29.0 - 29.99 AC
 - ㉛ 30.0 - 30.99 AC
 - ㉜ 31.0 - 31.99 AC
 - ㉝ 32.0 - 32.99 AC
 - ㉞ 33.0 - 33.99 AC
 - ㉟ 34.0 - 34.99 AC
 - ㊱ 35.0 - 35.99 AC
 - ㊲ 36.0 - 36.99 AC
 - ㊳ 37.0 - 37.99 AC
 - ㊴ 38.0 - 38.99 AC
 - ㊵ 39.0 - 39.99 AC
 - ㊶ 40.0 - 40.99 AC
 - ㊷ 41.0 - 41.99 AC
 - ㊸ 42.0 - 42.99 AC
 - ㊹ 43.0 - 43.99 AC
 - ㊺ 44.0 - 44.99 AC
 - ㊻ 45.0 - 45.99 AC
 - ㊼ 46.0 - 46.99 AC
 - ㊽ 47.0 - 47.99 AC
 - ㊾ 48.0 - 48.99 AC
 - ㊿ 49.0 - 49.99 AC
 - ① 50.0 - 50.99 AC
 - ② 51.0 - 51.99 AC
 - ③ 52.0 - 52.99 AC
 - ④ 53.0 - 53.99 AC
 - ⑤ 54.0 - 54.99 AC
 - ⑥ 55.0 - 55.99 AC
 - ⑦ 56.0 - 56.99 AC
 - ⑧ 57.0 - 57.99 AC
 - ⑨ 58.0 - 58.99 AC
 - ⑩ 59.0 - 59.99 AC
 - ⑪ 60.0 - 60.99 AC
 - ⑫ 61.0 - 61.99 AC
 - ⑬ 62.0 - 62.99 AC
 - ⑭ 63.0 - 63.99 AC
 - ⑮ 64.0 - 64.99 AC
 - ⑯ 65.0 - 65.99 AC
 - ⑰ 66.0 - 66.99 AC
 - ⑱ 67.0 - 67.99 AC
 - ⑲ 68.0 - 68.99 AC
 - ⑳ 69.0 - 69.99 AC
 - ㉑ 70.0 - 70.99 AC
 - ㉒ 71.0 - 71.99 AC
 - ㉓ 72.0 - 72.99 AC
 - ㉔ 73.0 - 73.99 AC
 - ㉕ 74.0 - 74.99 AC
 - ㉖ 75.0 - 75.99 AC
 - ㉗ 76.0 - 76.99 AC
 - ㉘ 77.0 - 77.99 AC
 - ㉙ 78.0 - 78.99 AC
 - ㉚ 79.0 - 79.99 AC
 - ㉛ 80.0 - 80.99 AC
 - ㉜ 81.0 - 81.99 AC
 - ㉝ 82.0 - 82.99 AC
 - ㉞ 83.0 - 83.99 AC
 - ㉟ 84.0 - 84.99 AC
 - ㊱ 85.0 - 85.99 AC
 - ㊲ 86.0 - 86.99 AC
 - ㊳ 87.0 - 87.99 AC
 - ㊴ 88.0 - 88.99 AC
 - ㊵ 89.0 - 89.99 AC
 - ㊶ 90.0 - 90.99 AC
 - ㊷ 91.0 - 91.99 AC
 - ㊸ 92.0 - 92.99 AC
 - ㊹ 93.0 - 93.99 AC
 - ㊺ 94.0 - 94.99 AC
 - ㊻ 95.0 - 95.99 AC
 - ㊼ 96.0 - 96.99 AC
 - ㊽ 97.0 - 97.99 AC
 - ㊾ 98.0 - 98.99 AC
 - ㊿ 99.0 - 99.99 AC
 - ① 100.0 - 100.99 AC
 - ② 101.0 - 101.99 AC
 - ③ 102.0 - 102.99 AC
 - ④ 103.0 - 103.99 AC
 - ⑤ 104.0 - 104.99 AC
 - ⑥ 105.0 - 105.99 AC
 - ⑦ 106.0 - 106.99 AC
 - ⑧ 107.0 - 107.99 AC
 - ⑨ 108.0 - 108.99 AC
 - ⑩ 109.0 - 109.99 AC
 - ⑪ 110.0 - 110.99 AC
 - ⑫ 111.0 - 111.99 AC
 - ⑬ 112.0 - 112.99 AC
 - ⑭ 113.0 - 113.99 AC
 - ⑮ 114.0 - 114.99 AC
 - ⑯ 115.0 - 115.99 AC
 - ⑰ 116.0 - 116.99 AC
 - ⑱ 117.0 - 117.99 AC
 - ⑲ 118.0 - 118.99 AC
 - ⑳ 119.0 - 119.99 AC
 - ㉑ 120.0 - 120.99 AC
 - ㉒ 121.0 - 121.99 AC
 - ㉓ 122.0 - 122.99 AC
 - ㉔ 123.0 - 123.99 AC
 - ㉕ 124.0 - 124.99 AC
 - ㉖ 125.0 - 125.99 AC
 - ㉗ 126.0 - 126.99 AC
 - ㉘ 127.0 - 127.99 AC
 - ㉙ 128.0 - 128.99 AC
 - ㉚ 129.0 - 129.99 AC
 - ㉛ 130.0 - 130.99 AC
 - ㉜ 131.0 - 131.99 AC
 - ㉝ 132.0 - 132.99 AC
 - ㉞ 133.0 - 133.99 AC
 - ㉟ 134.0 - 134.99 AC
 - ㊱ 135.0 - 135.99 AC
 - ㊲ 136.0 - 136.99 AC
 - ㊳ 137.0 - 137.99 AC
 - ㊴ 138.0 - 138.99 AC
 - ㊵ 139.0 - 139.99 AC
 - ㊶ 140.0 - 140.99 AC
 - ㊷ 141.0 - 141.99 AC
 - ㊸ 142.0 - 142.99 AC
 - ㊹ 143.0 - 143.99 AC
 - ㊺ 144.0 - 144.99 AC
 - ㊻ 145.0 - 145.99 AC
 - ㊼ 146.0 - 146.99 AC
 - ㊽ 147.0 - 147.99 AC
 - ㊾ 148.0 - 148.99 AC
 - ㊿ 149.0 - 149.99 AC
 - ① 150.0 - 150.99 AC
 - ② 151.0 - 151.99 AC
 - ③ 152.0 - 152.99 AC
 - ④ 153.0 - 153.99 AC
 - ⑤ 154.0 - 154.99 AC
 - ⑥ 155.0 - 155.99 AC
 - ⑦ 156.0 - 156.99 AC
 - ⑧ 157.0 - 157.99 AC
 - ⑨ 158.0 - 158.99 AC
 - ⑩ 159.0 - 159.99 AC
 - ⑪ 160.0 - 160.99 AC
 - ⑫ 161.0 - 161.99 AC
 - ⑬ 162.0 - 162.99 AC
 - ⑭ 163.0 - 163.99 AC
 - ⑮ 164.0 - 164.99 AC
 - ⑯ 165.0 - 165.99 AC
 - ⑰ 166.0 - 166.99 AC
 - ⑱ 167.0 - 167.99 AC
 - ⑲ 168.0 - 168.99 AC
 - ⑳ 169.0 - 169.99 AC
 - ㉑ 170.0 - 170.99 AC
 - ㉒ 171.0 - 171.99 AC
 - ㉓ 172.0 - 172.99 AC
 - ㉔ 173.0 - 173.99 AC
 - ㉕ 174.0 - 174.99 AC
 - ㉖ 175.0 - 175.99 AC
 - ㉗ 176.0 - 176.99 AC
 - ㉘ 177.0 - 177.99 AC
 - ㉙ 178.0 - 178.99 AC
 - ㉚ 179.0 - 179.99 AC
 - ㉛ 180.0 - 180.99 AC
 - ㉜ 181.0 - 181.99 AC
 - ㉝ 182.0 - 182.99 AC
 - ㉞ 183.0 - 183.99 AC
 - ㉟ 184.0 - 184.99 AC
 - ㊱ 185.0 - 185.99 AC
 - ㊲ 186.0 - 186.99 AC
 - ㊳ 187.0 - 187.99 AC
 - ㊴ 188.0 - 188.99 AC
 - ㊵ 189.0 - 189.99 AC
 - ㊶ 190.0 - 190.99 AC
 - ㊷ 191.0 - 191.99 AC
 - ㊸ 192.0 - 192.99 AC
 - ㊹ 193.0 - 193.99 AC
 - ㊺ 194.0 - 194.99 AC
 - ㊻ 195.0 - 195.99 AC
 - ㊼ 196.0 - 196.99 AC
 - ㊽ 197.0 - 197.99 AC
 - ㊾ 198.0 - 198.99 AC
 - ㊿ 199.0 - 199.99 AC
 - ① 200.0 - 200.99 AC
 - ② 201.0 - 201.99 AC
 - ③ 202.0 - 202.99 AC
 - ④ 203.0 - 203.99 AC
 - ⑤ 204.0 - 204.99 AC
 - ⑥ 205.0 - 205.99 AC
 - ⑦ 206.0 - 206.99 AC
 - ⑧ 207.0 - 207.99 AC
 - ⑨ 208.0 - 208.99 AC
 - ⑩ 209.0 - 209.99 AC
 - ⑪ 210.0 - 210.99 AC
 - ⑫ 211.0 - 211.99 AC
 - ⑬ 212.0 - 212.99 AC
 - ⑭ 213.0 - 213.99 AC
 - ⑮ 214.0 - 214.99 AC
 - ⑯ 215.0 - 215.99 AC
 - ⑰ 216.0 - 216.99 AC
 - ⑱ 217.0 - 217.99 AC
 - ⑲ 218.0 - 218.99 AC
 - ⑳ 219.0 - 219.99 AC
 - ㉑ 220.0 - 220.99 AC
 - ㉒ 221.0 - 221.99 AC
 - ㉓ 222.0 - 222.99 AC
 - ㉔ 223.0 - 223.99 AC
 - ㉕ 224.0 - 224.99 AC
 - ㉖ 225.0 - 225.99 AC
 - ㉗ 226.0 - 226.99 AC
 - ㉘ 227.0 - 227.99 AC
 - ㉙ 228.0 - 228.99 AC
 - ㉚ 229.0 - 229.99 AC
 - ㉛ 230.0 - 230.99 AC
 - ㉜ 231.0 - 231.99 AC
 - ㉝ 232.0 - 232.99 AC
 - ㉞ 233.0 - 233.99 AC
 - ㉟ 234.0 - 234.99 AC
 - ㊱ 235.0 - 235.99 AC
 - ㊲ 236.0 - 236.99 AC
 - ㊳ 237.0 - 237.99 AC
 - ㊴ 238.0 - 238.99 AC
 - ㊵ 239.0 - 239.99 AC
 - ㊶ 240.0 - 240.99 AC
 - ㊷ 241.0 - 241.99 AC
 - ㊸ 242.0 - 242.99 AC
 - ㊹ 243.0 - 243.99 AC
 - ㊺ 244.0 - 244.99 AC
 - ㊻ 245.0 - 245.99 AC
 - ㊼ 246.0 - 246.99 AC
 - ㊽ 247.0 - 247.99 AC
 - ㊾ 248.0 - 248.99 AC
 - ㊿ 249.0 - 249.99 AC
 - ① 250.0 - 250.99 AC
 - ② 251.0 - 251.99 AC
 - ③ 252.0 - 252.99 AC
 - ④ 253.0 - 253.99 AC
 - ⑤ 254.0 - 254.99 AC
 - ⑥ 255.0 - 255.99 AC
 - ⑦ 256.0 - 256.99 AC
 - ⑧ 257.0 - 257.99 AC
 - ⑨ 258.0 - 258.99 AC
 - ⑩ 259.0 - 259.99 AC
 - ⑪ 260.0 - 260.99 AC
 - ⑫ 261.0 - 261.99 AC
 - ⑬ 262.0 - 262.99 AC
 - ⑭ 263.0 - 263.99 AC
 - ⑮ 264.0 - 264.99 AC
 - ⑯ 265.0 - 265.99 AC
 - ⑰ 266.0 - 266.99 AC
 - ⑱ 267.0 - 267.99 AC
 - ⑲ 268.0 - 268.99 AC
 - ⑳ 269.0 - 269.99 AC
 - ㉑ 270.0 - 270.99 AC
 - ㉒ 271.0 - 271.99 AC
 - ㉓ 272.0 - 272.99 AC
 - ㉔ 273.0 - 273.99 AC
 - ㉕ 274.0 - 274.99 AC
 - ㉖ 275.0 - 275.99 AC
 - ㉗ 276.0 - 276.99 AC
 - ㉘ 277.0 - 277.99 AC
 - ㉙ 278.0 - 278.99 AC
 - ㉚ 279.0 - 279.99 AC
 - ㉛ 280.0 - 280.99 AC
 - ㉜ 281.0 - 281.99 AC
 - ㉝ 282.0 - 282.99 AC
 - ㉞ 283.0 - 283.99 AC
 - ㉟ 284.0 - 284.99 AC
 - ㊱ 285.0 - 285.99 AC
 - ㊲ 286.0 - 286.99 AC
 - ㊳ 287.0 - 287.99 AC
 - ㊴ 288.0 - 288.99 AC
 - ㊵ 289.0 - 289.99 AC
 - ㊶ 290.0 - 290.99 AC
 - ㊷ 291.0 - 291.99 AC
 - ㊸ 292.0 - 292.99 AC
 - ㊹ 293.0 - 293.99 AC
 - ㊺ 294.0 - 294.99 AC
 - ㊻ 295.0 - 295.99 AC
 - ㊼ 296.0 - 296.99 AC
 - ㊽ 297.0 - 297.99 AC
 - ㊾ 298.0 - 298.99 AC
 - ㊿ 299.0 - 299.99 AC
 - ① 300.0 - 300.99 AC
 - ② 301.0 - 301.99 AC
 - ③ 302.0 - 302.99 AC
 - ④ 303.0 - 303.99 AC
 - ⑤ 304.0 - 304.99 AC
 - ⑥ 305.0 - 305.99 AC
 - ⑦ 306.0 - 306.99 AC
 - ⑧ 307.0 - 307.99 AC
 - ⑨ 308.0 - 308.99 AC
 - ⑩ 309.0 - 309.99 AC
 - ⑪ 310.0 - 310.99 AC
 - ⑫ 311.0 - 311.99 AC
 - ⑬ 312.0 - 312.99 AC
 - ⑭ 313.0 - 313.99 AC
 - ⑮ 314.0 - 314.99 AC
 - ⑯ 315.0 - 315.99 AC
 - ⑰ 316.0 - 316.99 AC
 - ⑱ 317.0 - 317.99 AC
 - ⑲ 318.0 - 318.99 AC
 - ⑳ 319.0 - 319.99 AC
 - ㉑ 320.0 - 320.99 AC
 - ㉒ 321.0 - 321.99 AC
 - ㉓ 322.0 - 322.99 AC
 - ㉔ 323.0 - 323.99 AC
 - ㉕ 324.0 - 324.99 AC
 - ㉖ 325.0 - 325.99 AC
 - ㉗ 326.0 - 326.99 AC
 - ㉘ 327.0 - 327.99 AC
 - ㉙ 328.0 - 328.99 AC
 - ㉚ 329.0 - 329.99 AC
 - ㉛ 330.0 - 330.99 AC
 - ㉜ 331.0 - 331.99 AC
 - ㉝ 332.0 - 332.99 AC
 - ㉞ 333.0 - 333.99 AC
 - ㉟ 334.0 - 334.99 AC
 - ㊱ 335.0 - 335.99 AC
 - ㊲ 336.0 - 336.99 AC
 - ㊳ 337.0 - 337.99 AC
 - ㊴ 338.0 - 338.99 AC
 - ㊵ 339.0 - 339.99 AC
 - ㊶ 340.0 - 340.99 AC
 - ㊷ 341.0 - 341.99 AC
 - ㊸ 342.0 - 342.99 AC
 - ㊹ 343.0 - 343.99 AC
 - ㊺ 344.0 - 344.99 AC
 - ㊻ 345.0 - 345.99 AC
 - ㊼ 346.0 - 346.99 AC
 - ㊽ 347.0 - 347.99 AC
 - ㊾ 348.0 - 348.99 AC
 - ㊿ 349.0 - 349.99 AC
 - ① 350.0 - 350.99 AC
 - ② 351.0 - 351.99 AC
 - ③ 352.0 - 352.99 AC
 - ④ 353.0 - 353.99 AC
 - ⑤ 354.0 - 354.99 AC
 - ⑥ 355.0 - 355.99 AC
 - ⑦ 356.0 - 356.99 AC
 - ⑧ 357.0 - 357.99 AC
 - ⑨ 358.0 - 358.99 AC
 - ⑩ 359.0 - 359.99 AC
 - ⑪ 360.0 - 360.99 AC
 - ⑫ 361.0 - 361.99 AC
 - ⑬ 362.0 - 362.99 AC
 - ⑭ 363.0 - 363.99 AC
 - ⑮ 364.0 - 364.99 AC
 - ⑯ 365.0 - 365.99 AC
 - ⑰ 366.0 - 366.99 AC
 - ⑱ 367.0 - 367.99 AC
 - ⑲ 368.0 - 368.99 AC
 - ⑳ 369.0 - 369.99 AC
 - ㉑ 370.0 - 370.99 AC
 - ㉒ 371.0 - 371.99 AC
 - ㉓ 372.0 - 372.99 AC
 - ㉔ 373.0 - 373.99 AC
 - ㉕ 374.0 - 374.99 AC
 - ㉖ 375.0 - 375.99 AC
 - ㉗ 376.0 - 376.99 AC
 - ㉘ 377.0 - 377.99 AC
 - ㉙ 378.0 - 378.99 AC
 - ㉚ 379.0 - 379.99 AC
 - ㉛ 380.0 - 380.99 AC
 - ㉜ 381.0 - 381.99 AC
 - ㉝ 382.0 - 382.99 AC
 - ㉞ 383.0 - 383.99 AC
 - ㉟ 384.0 - 384.99 AC
 - ㊱ 385.0 - 385.99 AC
 - ㊲ 386.0 - 386.99 AC
 - ㊳ 387.0 - 387.99 AC
 - ㊴ 388.0 - 388.99 AC
 - ㊵ 389.0 - 389.99 AC
 - ㊶ 390.0 - 390.99 AC
 - ㊷ 391.0 - 391.99 AC
 - ㊸ 392.0 - 392.99 AC
 - ㊹ 393.0 - 393.99 AC
 - ㊺ 394.0 - 394.99 AC
 - ㊻ 395.0 - 395.99 AC
 - ㊼ 396.0 - 396.99 AC
 - ㊽ 397.0 - 397.99 AC
 - ㊾ 398.0 - 398.99 AC
 - ㊿ 399.0 - 399.99 AC
 - ① 400.0 - 400.99 AC
 - ② 401.0 - 401.99 AC
 - ③ 402.0 - 402.99 AC
 - ④ 403.0 - 403.99 AC
 - ⑤ 404.0 - 404.99 AC
 - ⑥ 405.0 - 405.99 AC
 - ⑦ 406.0 - 406.99 AC
 - ⑧ 407.0 - 407.99 AC
 - ⑨ 408.0 - 408.99 AC
 - ⑩ 409.0 - 409.99 AC
 - ⑪ 410.0 - 410.99 AC
 - ⑫ 411.0 - 411.99 AC
 - ⑬ 412.0 - 412.99 AC
 - ⑭ 413.0 - 413.99 AC
 - ⑮ 414.0 - 414.99 AC
 - ⑯ 415.0 - 415.99 AC
 - ⑰ 416.0 - 416.99 AC
 - ⑱ 417.0 - 417.99 AC
 - ⑲ 418.0 - 418.99 AC
 - ⑳ 419.0 - 419.99 AC
 - ㉑ 420.0 - 420.99 AC
 - ㉒ 421.0 - 421.99 AC
 - ㉓ 422.0 - 422.99 AC
 - ㉔ 423.0 - 423.99 AC
 - ㉕ 424.0 - 424.99 AC
 - ㉖ 425.0 - 425.99 AC
 - ㉗ 426.0 - 426.99 AC
 - ㉘ 427.0 - 427.99 AC
 - ㉙ 428.0 - 428.99 AC
 - ㉚ 429.0 - 429.99 AC
 - ㉛ 430.0 - 430.99 AC
 - ㉜ 431.0 - 431.99 AC
 - ㉝ 432.0 - 432.99 AC
 - ㉞ 433.0 - 433.99 AC
 - ㉟ 434.0 - 434.99 AC
 - ㊱ 435.0 - 435.99 AC
 - ㊲ 436.0 - 436.99 AC
 - ㊳ 437.0 - 437.99 AC
 - ㊴ 438.0 - 438.99 AC
 - ㊵ 439.0 - 439.99 AC
 - ㊶ 440.0 - 440.99 AC
 - ㊷ 441.0 - 441.99 AC
 - ㊸ 442.0 - 442.99 AC
 - ㊹ 443.0 - 443.99 AC
 - ㊺ 444.0 - 444.99 AC
 - ㊻ 445.0 - 445.99 AC
 - ㊼ 446.0 - 446.99 AC
 - ㊽ 447.0 - 447.99 AC
 - ㊾ 448.0 - 448.99 AC
 - ㊿ 449.0 - 449.99 AC
 - ① 450.0 - 450.99 AC
 - ② 451.0 - 451.99 AC
 - ③ 452.0 - 452.99 AC
 - ④ 453.0 - 453.99 AC
 - ⑤ 454.0 - 454.99 AC
 - ⑥ 455.0 - 455.99 AC
 - ⑦ 456.0 - 456.99 AC
 - ⑧ 457.0 - 457.99 AC
 - ⑨ 458.0 - 458.99 AC
 - ⑩ 459.0 - 459.99 AC
 - ⑪ 460.0 - 460.99 AC
 - ⑫ 461.0 - 461.99 AC
 - ⑬ 462.0 - 462.99 AC
 - ⑭ 463.0 - 463.99 AC
 - ⑮ 464.0 - 464.99 AC
 - ⑯ 465.0 - 465.99 AC
 - ⑰ 466.0 - 466.99 AC
 - ⑱ 467.0 - 467.99 AC
 - ⑲ 468.0 - 468.99 AC
 - ⑳ 469.0 - 469.99 AC
 - ㉑ 470.0 - 470.99 AC
 - ㉒ 471.0 - 471.99 AC
 - ㉓ 472.0 - 472.99 AC
 - ㉔ 473.0 - 473.99 AC
 - ㉕ 474.0 - 474.99 AC
 - ㉖ 475.0 - 475.99 AC
 - ㉗ 476.0 - 476.99 AC
 - ㉘ 477.0 - 477.99 AC
 - ㉙ 478.0 - 478.99 AC
 - ㉚ 479.0 - 479.99 AC
 - ㉛ 480.0 - 480.99 AC
 - ㉜ 481.0 - 481.99 AC
 - ㉝ 482.0 - 482.99 AC
 - ㉞ 483.0 - 483.99 AC
 - ㉟ 484.0 - 484.99 AC
 - ㊱ 485.0 - 485.99 AC
 - ㊲ 486.0 - 486.99 AC
 - ㊳ 487.0 - 487.99 AC
 - ㊴ 488.0 - 488.99 AC
 - ㊵ 489.0 - 489.99 AC
 - ㊶ 490.0 - 490.99 AC
 - ㊷ 491.0 - 491.99 AC
 - ㊸ 492.0 - 492.99 AC
 - ㊹ 493.0 - 493.99 AC
 - ㊺ 494.0 - 494.99 AC
 - ㊻ 495.0 - 495.99 AC
 - ㊼ 496.0 - 496.99 AC
 - ㊽ 497.0 - 497.99 AC
 - ㊾ 498.0 - 498.99 AC
 - ㊿ 499.0 - 499.99 AC
 - ① 500.0 - 500.99 AC
 - ② 501.0 - 501.99 AC
 - ③ 502.0 - 502.99 AC
 - ④ 503.0 - 503.99 AC
 - ⑤ 504.0 - 504.99 AC
 - ⑥ 505.0 - 505.99 AC
 - ⑦ 506.0 - 506.99 AC
 - ⑧ 507.0 - 507.99 AC
 - ⑨ 508.0 - 508.99 AC
 - ⑩ 509.0 - 509.99 AC
 - ⑪ 510.0 - 510.99 AC
 - ⑫ 511.0 - 511.99 AC
 - ⑬ 512.0 - 512.99 AC
 - ⑭ 513.0 - 513.99 AC
 - ⑮ 514.0 - 514.99 AC
 - ⑯ 515.0 - 515.99 AC
 - ⑰ 516.0 - 516.99 AC
 - ⑱ 517.0 - 517.99 AC
 - ⑲ 518.0 - 518.99 AC
 - ⑳ 519.0 - 519.99 AC
 - ㉑ 520.0 - 520.99 AC
 - ㉒ 521.0 - 521.99 AC
 - ㉓ 522.0 - 522.99 AC
 - ㉔ 523.0 - 523.99 AC
 -

SANITARY SEWER SYSTEM

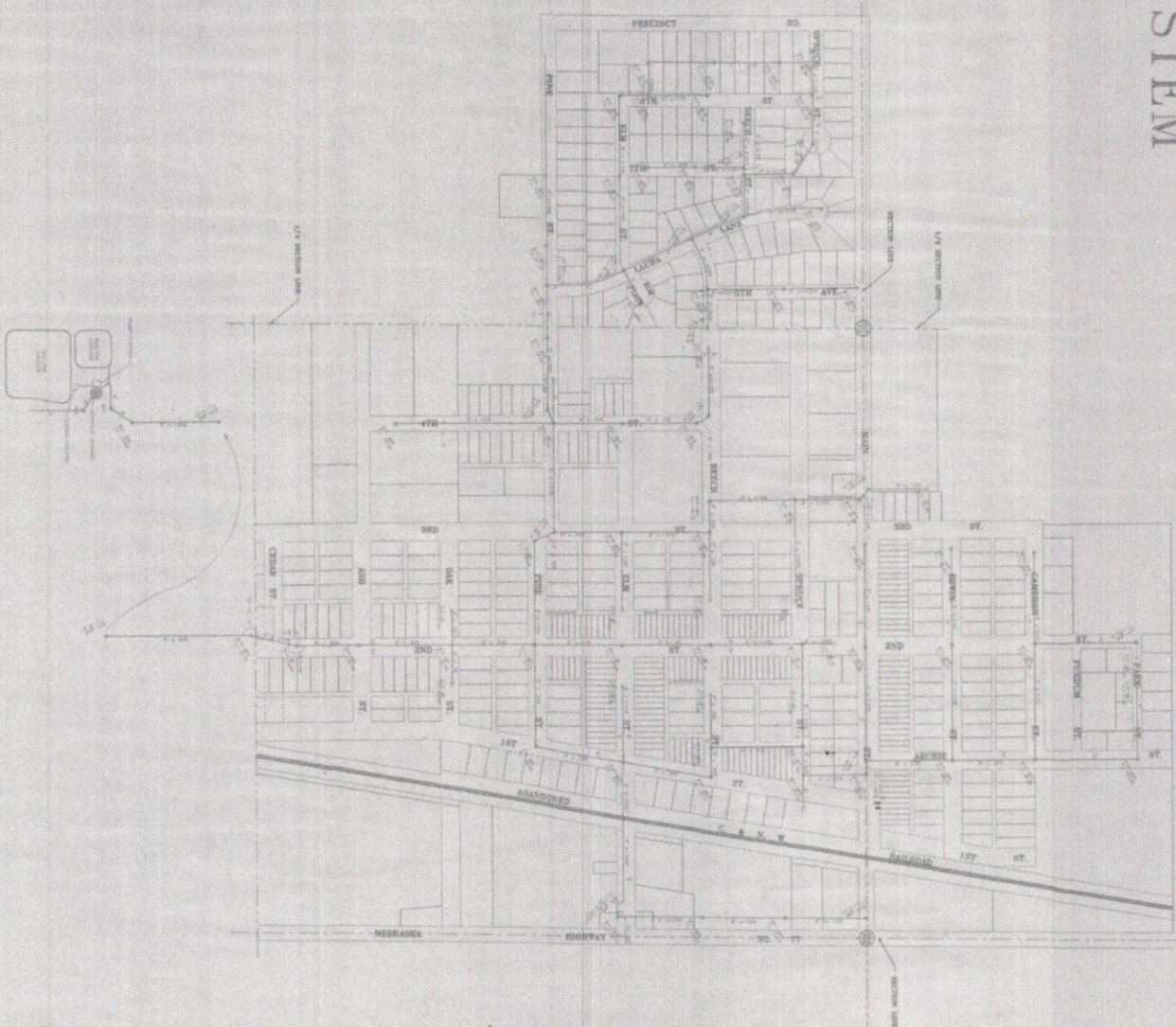
VILLAGE OF CERESCO

SAUNDERS COUNTY NEBRASKA

1993

SEWER SYSTEM LEGEND

- MANHOLE
- △ CLEANOUT
- DISTRIBUTION BOX
- LIFT STATION

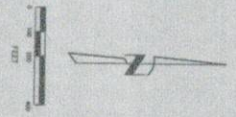


WATER SYSTEM MAP

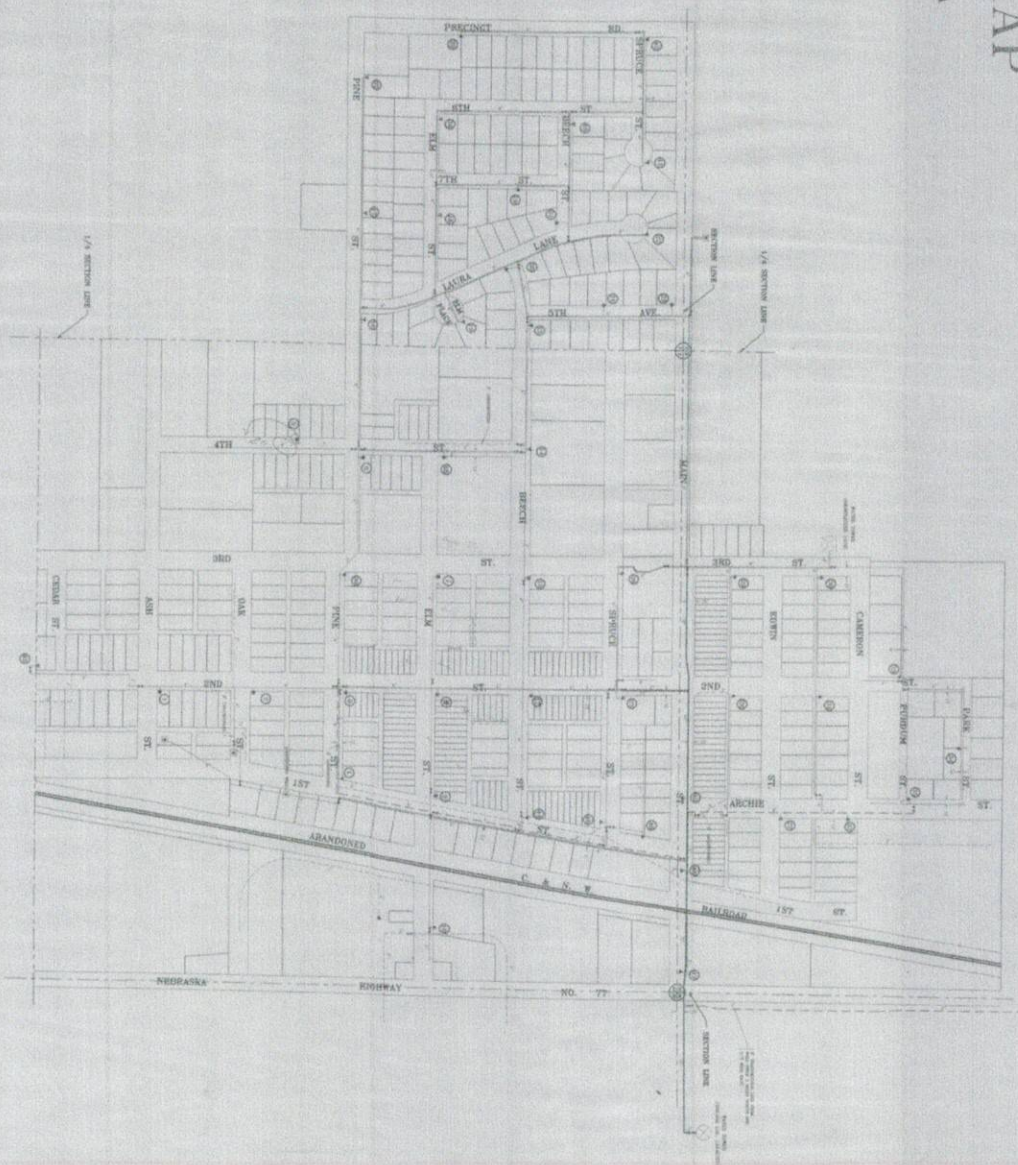
VILLAGE OF CERESCO SAUNDERS COUNTY NEBRASKA 1993

WATER SYSTEM LEGEND

- 2" WATER LINE
- 4" WATER LINE
- 6" WATER LINE
- 8" WATER LINE
- 10" WATER LINE
- HYDRANT NUMBER
- WATER TOWER
- HYDRANT WITH AUXILIARY VALVE
- HYDRANT WITHOUT AUXILIARY VALVE
- WELL AND PUMP
- VALVE
- TEE

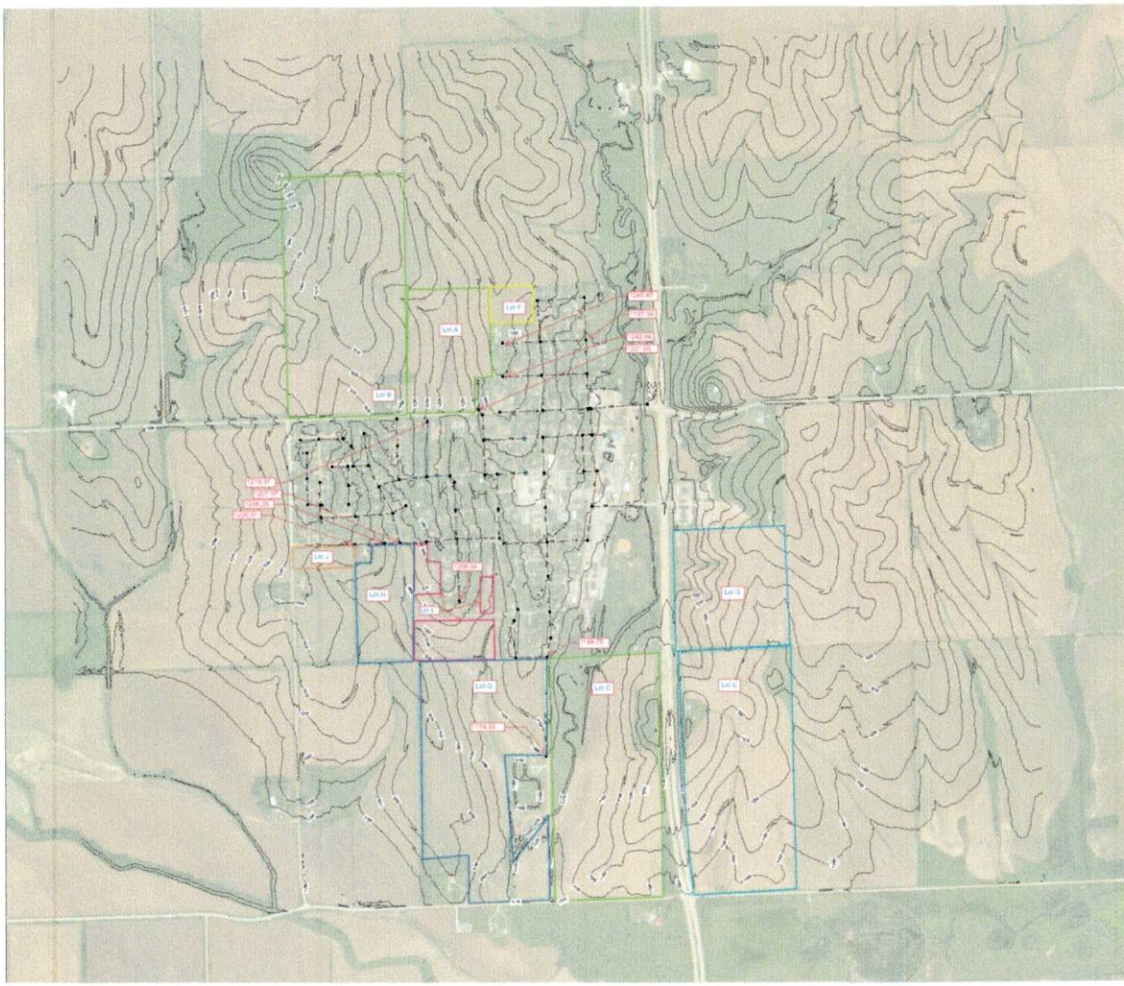


NOTE:
THIS MAP WAS PREPARED FOR THE PREPARATION OF
THE MAP AND PLANS FOR THE WATER SYSTEM MAPS
AND PLATS PROVIDED BY THE VILLAGE OF CERESCO
OR FROM INFORMATION ON FILE IN THE SAUNDERS COUNTY
COURTHOUSE.



Appendix I: Property Elevations and Boundaries

Appendix I: Current Zoning Map



GRAPHIC SCALE
 0 50 100
 UNIT OF MEASURE IS FEET

Legend

- Sewer Main
- Manholes
- Lift Station
- Cleanouts

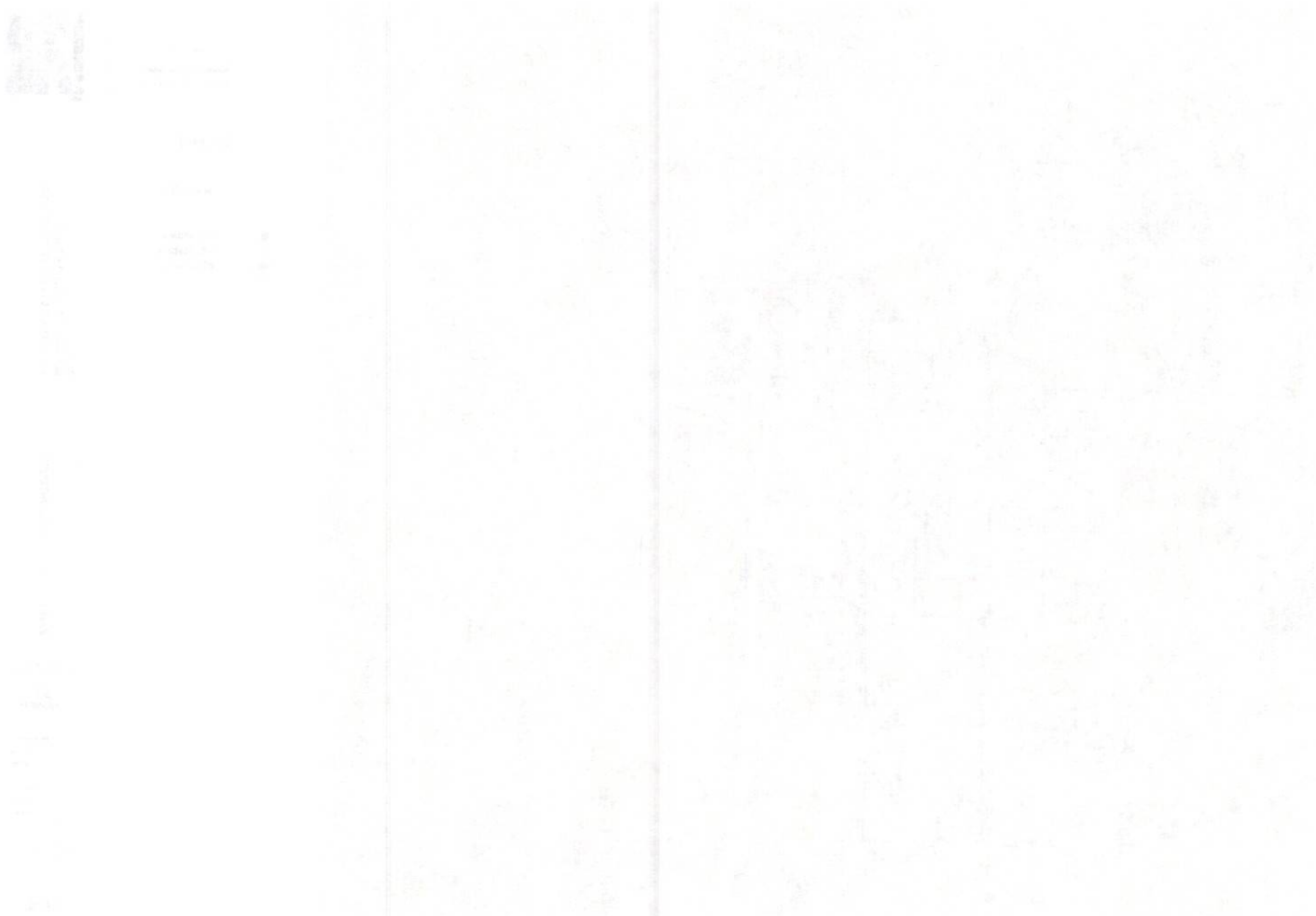
2019
 WATER AND SEWER STUDY
 VILLAGE OF CERESCO, NEBRASKA

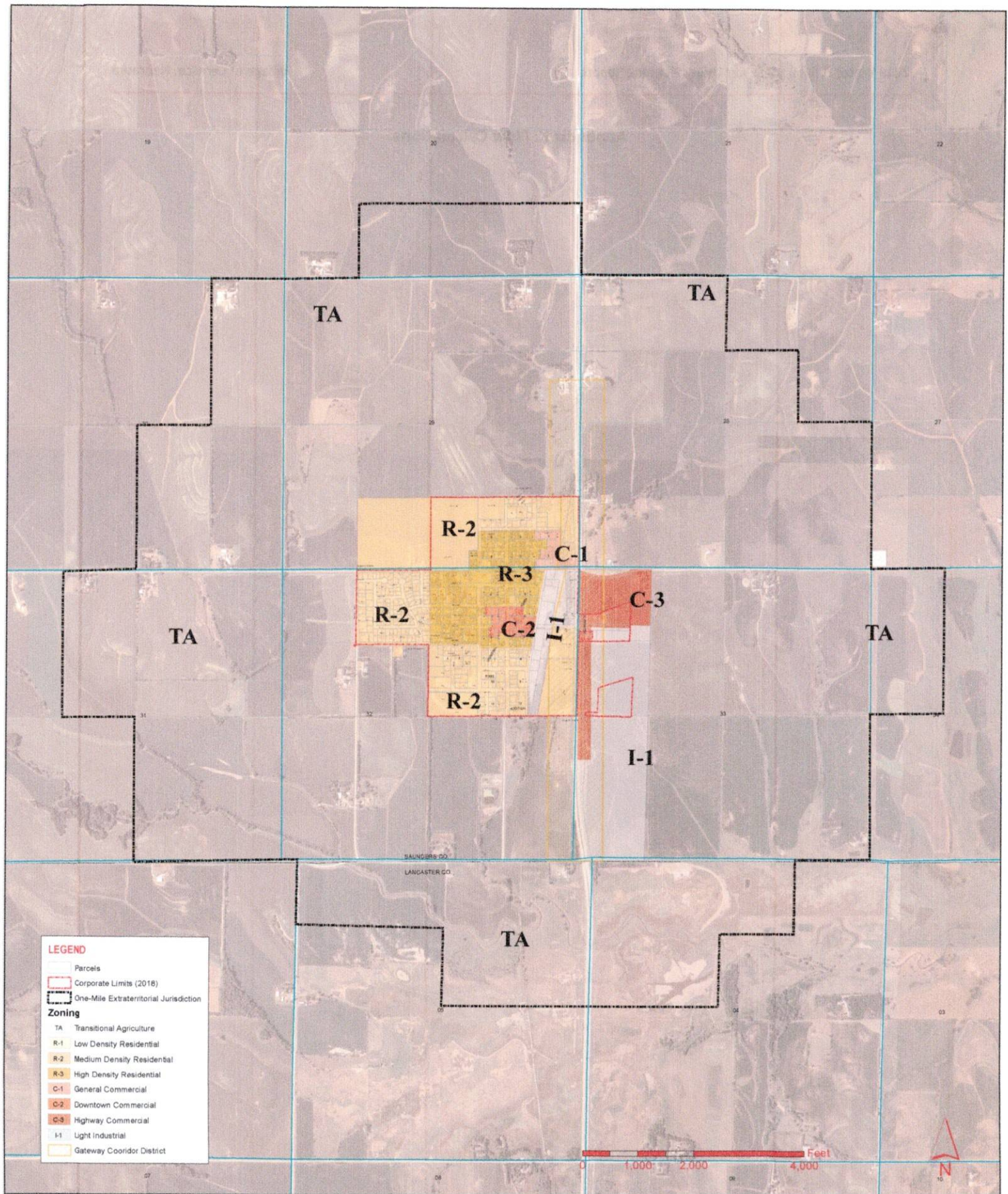
SANITARY BASE AND CONTOURS

PRELIMINARY
 NOT FOR CONSTRUCTION
 DATE
 10/23/2018

QA/QC

Appendix J: Ceresco Zoning Map





THIS IS TO CERTIFY THAT THIS IS THE OFFICIAL ZONING MAP REFERRED TO IN SECTION _____ OF ORDINANCE NO. _____ OF THE VILLAGE OF CERESCO, NEBRASKA. THIS OFFICIAL ZONING DISTRICT MAP SUPERSEDES AND REPLACES ANY OR ALL OTHER OFFICIAL ZONING DISTRICT MAPS ADOPTED ON THIS _____ DAY OF _____, 20____.

REVISION DATE	ORDINANCE NO.	SIGNATURE	REVISION DATE	ORDINANCE NO.	SIGNATURE

Village of Ceresco, Nebraska

Zoning Map

Created By: C. Sloss
Date: 12/12/2017
Revised: 10/15/2018
Software: ArcGIS 10.4
File: 171020.00



This map was prepared using information from record drawings supplied by JEO and/or other applicable city, county, federal, or public or private entities. JEO does not guarantee the accuracy of this map or the information used to prepare this map. This is not a scaled plot.

Appendix K: Flow Calculations

Lot A (Based on existing plat information) (Example)

Estimated Population

66 residences x 3 people/residence = 198 people
198 people + 889 people (existing) = **1,087 people**

Estimated Water Demands

Projected Daily Average = 198 people x 97 gpcpd = 19,000 gpd = 13 gpm
19,000 gpd + 87,000 gpd (existing) = **106,000 gpd**
13 gpm + 61 gpm (existing) = **74 gpm**
Estimated Peak Day Flow = 19,000 x 2.5 = 47,500 gpd = 33 gpm
33 gpm + 151 gpm (existing) = **184 gpm**
Estimated Peak Hour Flow = 13 gpm x 4.0 = 52 gpm
52 gpm + 244 gpm (existing) = **296 gpm**
Storage Tank Capacity = 300,000 gpd / 106,000 gpd = **2.8 days** capacity

Estimated Wastewater Demands

Projected Daily Average 198 people x 97 gpcpd = 19,000 gpd = 13 gpm
19,000 gpd + 48,700 gpd (existing) = **67,700 gpd**
Estimated Peak Day Flow = 19,000 x 2.5 = 47,500 gpd
47,500 gpd + 121,800 gpd (existing) = **169,300 gpd**

Lot B (Example)

Estimated Population

80 acres x 3.5 residences/acre x 3 people/residence = 840 new people
840 people + 889 people (existing) = **1,729 people**

Estimated Water Demands

Projected Daily Average = 80 acres x 1,000 gal/(acre*day) = 80,000 gpd = 56 gpm
80,000 gpd + 87,000 gpd (existing) = **167,000 gpd**
56 gpm + 61 gpm (existing) = **117 gpm**
Estimated Peak Day Flow = 80,000 x 2.5 = 200,000 gpd = 139 gpm
139 gpm + 151 gpm (existing) = **290 gpm**
Estimated Peak Hour Flow = 56 gpm x 4.0 = 224 gpm
224 gpm + 244 gpm (existing) = **468 gpm**
Storage Tank Capacity = 300,000 gpd / 167,000 gpd = **1.8 days** capacity

Estimated Wastewater Demands

Projected Daily Average = 80 acres x 1,000 gal/(acre*day) = 80,000 gpd = 56 gpm
80,000 gpd + 48,700 gpd (existing) = **128,700 gpd**
56 gpm + 34 gpm (existing) = 90 gpm
Estimated Peak Day Flow = 80,000 x 2.5 = 200,000 gpd
200,000 gpd + 122,000 gpd (existing) = **322,000 gpd**

Lot 1 (Based on existing water demand) (Example)

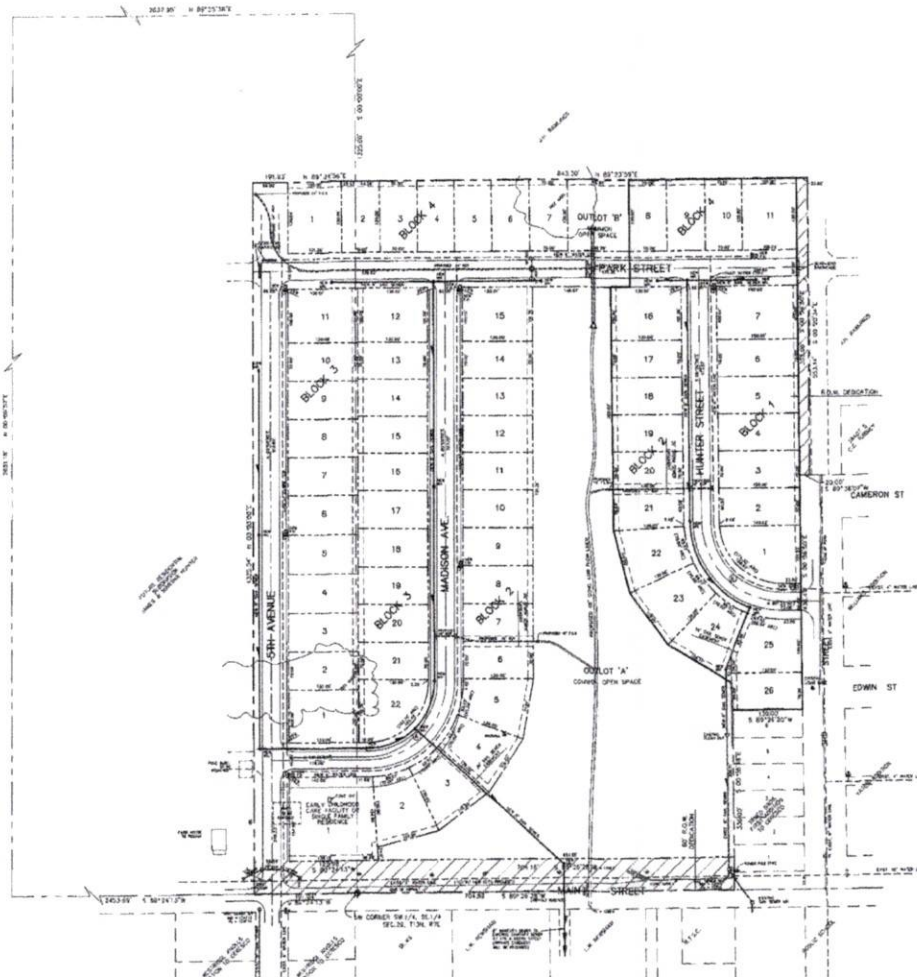
Estimated Peak Hour Demand
 189 gpm (Based on 189 people x 100 gpm/person)
 189 gpm (Based on 189 people x 100 gpm/person)

Estimated Water Demand
 189 gpm (Based on 189 people x 100 gpm/person)
 189 gpm (Based on 189 people x 100 gpm/person)
 189 gpm (Based on 189 people x 100 gpm/person)
 189 gpm (Based on 189 people x 100 gpm/person)
 189 gpm (Based on 189 people x 100 gpm/person)
 189 gpm (Based on 189 people x 100 gpm/person)
 189 gpm (Based on 189 people x 100 gpm/person)
 189 gpm (Based on 189 people x 100 gpm/person)
 189 gpm (Based on 189 people x 100 gpm/person)
 189 gpm (Based on 189 people x 100 gpm/person)

	Lot A	Lot B	Lot C	Lot D	Lot E	Lot F	Lot G	Lot H	Lot I	Lot J	
Lot Contributions	Size (Acres)	66 parcels	80	73	36	68	6	67	18	15	4
	Population	198	840	767	378	714	63	704	189	158	42
	Daily Average (Water) (gpm)	13	56	51	25	47	4.2	47	13	10	2.8
	Peak Daily (Water) (gpm)	33	139	51	25	47	4	47	13	10	3
	Peak Hourly (Water) (gpm)	53	222	203	100	189	17	186	50	42	11
Total Village Demands	Daily Average (WW) (gpd)	19,000	80,000	73,000	36,000	68,000	6,000	67,000	18,000	15,000	4,000
	Peak Daily (WW) (gpd)	47,500	200,000	182,500	90,000	170,000	15,000	167,500	45,000	37,500	10,000
	Population	1,087	1,729	1,656	1,267	1,603	952	1,593	1,078	1,047	931
	Daily Average (Water) (gpd)	106,000	167,000	160,000	123,000	155,000	93,000	154,000	105,000	102,000	91,000
	Peak Daily (Water) (gpm)	184	290	202	176	198	155	198	164	161	154
	Peak Hourly (Water) (gpd)	297	466	447	344	433	261	430	294	286	255
	Storage Capacity (Water) (days)	2.8	1.8	1.9	2.4	1.9	3.2	1.9	2.9	2.9	3.3
	Daily Average (WW) (gpd)	67,700	128,700	121,700	84,700	116,700	54,700	115,700	66,700	63,700	52,700
	Peak Daily (WW) (gpd)	169,500	322,000	304,500	212,000	292,000	137,000	289,500	167,000	159,500	132,000

Appendix L: Hunter Addition





BRIAN D. CARSTENS & ASSOCIATES
 LAND PLANNERS
 RESIDENTIAL & COMMERCIAL DESIGN
 2915 PINE LAKE ROAD
 SUITE 10
 LINCOLN, NE 68516
 PHONE: (402) 674-2424
 FAX: (402) 674-0967

HUNTER ADDITION

PRELIMINARY
 PLAT
 AND
 CHANGE
 OF
 ZONE

3RD & MAIN STREET
 CERESCO, NE

UTILITY PLAN

SCALE: 1" = 80'
 PROJECT NUMBER
 DATE: 10/10/08
 DRAWN BY

Appendix M: Opinions of Probable Costs

ENGINEER'S BUDGETARY OPINION OF PROBABLE COST

Water and Sanitary Sewer Utility Planning Report

Ceresco, NE

JEO Project No. 181283.00

Date Prepared:

January 30, 2019

**ESTIMATE OF QUANTITIES**

Item #	Description	Unit	Quantity	Unit Price	Total
LOT B - BOOSTER STATION, AND SANITARY SEWER MAIN EXTENSION					
1.	Mobilization	LS	1	\$40,000.00	\$40,000
2.	Bonding and Insurance	LS	1	\$15,000.00	\$15,000
3.	Water Booster Station	LS	1	\$400,000.00	\$400,000
4.	8" PVC Sanitary Sewer Main, SDR 35	LF	1,200	\$45.00	\$60,000
5.	48" Dia. Concrete Manhole	VF	40	\$838.00	\$40,000
Construction Subtotal Lot B					\$555,000
Contingency 30%					\$170,000
Total Budgetary Construction Cost of Lot B Improvements					\$730,000

PROFESSIONAL SERVICES

1.	Land Acquisition	3%	\$20,000
2.	Overhead (Legal, Fiscal, Engineering, Etc.)	25%	\$190,000
Subtotal Professional Services			\$210,000
Total Budgetary Opinion of Construction Cost - Lot B			\$940,000

LOT C - WATER MAIN EXTENSION

1.	Mobilization	LS	1	\$10,000.00	\$10,000
2.	Bonding and Insurance	LS	1	\$2,500.00	\$2,500
3.	8" PVC Water Main, DR 18	LF	500	\$45.00	\$30,000
4.	6" Fire Hydrant Assembly	EA	2	\$4,000.00	\$8,000
Construction Subtotal Lot C					\$50,500
Contingency 30%					\$20,000
Total Budgetary Construction Cost of Lot C Improvements					\$80,000

PROFESSIONAL SERVICES

1.	Land Acquisition	3%	\$10,000
2.	Overhead (Legal, Fiscal, Engineering, Etc.)	25%	\$20,000
Subtotal Professional Services			\$30,000
Total Budgetary Opinion of Construction Cost - Lot C			\$110,000

LOT D - WATER MAIN EXTENSION, LIFT STATION IMPROVEMENTS, SANITARY SEWER MAIN EXTENSION

1.	Mobilization	LS	1	\$20,000.00	\$20,000
2.	Bonding and Insurance	LS	1	\$5,000.00	\$5,000
3.	10" PVC Water Main, DR 18	LF	300	\$50.00	\$20,000
4.	6" Fire Hydrant Assembly	EA	1	\$4,000.00	\$4,000
5.	Sanitary Lift Station Improvements (100gpm)	LS	1	\$150,000.00	\$150,000
6.	8" PVC Sanitary Sewer Main, SDR 35	LF	300	\$45.00	\$20,000
7.	48" Dia. Concrete Manhole	VF	10	\$838.00	\$10,000
Construction Subtotal Lot D					\$230,000
Contingency 30%					\$70,000
Total Budgetary Construction Cost of Lot D Improvements					\$300,000

PROFESSIONAL SERVICES

1.	Land Acquisition	3%	\$10,000.00
2.	Overhead (Legal, Fiscal, Engineering, Etc.)	25%	\$80,000
Subtotal Professional Services			\$90,000
Total Budgetary Opinion of Construction Cost - Lot D			\$390,000

LOT E - WATER MAIN EXTENTION, LIFT STATION AND FORCEMAIN

1.	Mobilization	LS	1	\$30,000.00	\$30,000
2.	Bonding and Insurance	LS	1	\$10,000.00	\$10,000
3.	10" PVC Water Main, DR 18	LF	2,600	\$50.00	\$130,000
4.	6" Fire Hydrant Assembly	EA	7	\$4,000.00	\$30,000
5.	Sanitary Lift Station (120gpm)	LS	1	\$200,000.00	\$200,000
6.	6" PVC Force Main, SDR 21	LF	1,500	\$20.00	\$30,000

Construction Subtotal	Lot E	\$430,000
-----------------------	-------	-----------

Contingency	30%	\$130,000
-------------	-----	-----------

Total Budgetary Construction Cost of Lot E Improvements		\$560,000
--	--	------------------

PROFESSIONAL SERVICES

1.	Land Acquisition	3%	\$20,000.00
2.	Overhead (Legal, Fiscal, Engineering, Etc.)	25%	\$140,000
	Subtotal Professional Services		\$160,000
	Total Budgetary Opinion of Construction Cost - Lot E		\$720,000

LOT J - SANTIARY SEWER MAIN EXTENTION

1.	Mobilization	LS	1	\$10,000.00	\$10,000
2.	Bonding and Insurance	LS	1	\$2,500.00	\$2,500
3.	8" PVC Sanitary Sewer Main, SDR 35	LF	500	\$45.00	\$30,000
4.	48" Dia. Concrete Manhole	VF	2	\$838.00	\$10,000

Construction Subtotal	Lot J	\$60,000
-----------------------	-------	----------

Contingency	30%	\$20,000
-------------	-----	----------

Total Budgetary Construction Cost of Lot J Improvements		\$80,000
--	--	-----------------

PROFESSIONAL SERVICES

1.	Land Acquisition	3%	\$10,000.00
2.	Overhead (Legal, Fiscal, Engineering, Etc.)	25%	\$20,000
	Subtotal Professional Services		\$30,000
	Total Budgetary Opinion of Construction Cost - Lot J		\$110,000

JEO Consulting Group Inc.'s (JEO) Opinions of Probable Cost provided for herein are to be made on the basis of JEO's experience and qualifications and represent JEO's best judgment. However, since JEO has no control over the cost of labor, materials, equipment, or services furnished by others, or over the Contractor's methods of determining prices, or over competitive bidding or market conditions, JEO cannot and does not guarantee that proposals, bids, or actual construction cost will not vary from Opinions of Probable Cost prepared by JEO.

